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A CENTURY OF AMERICAN WOOL
MANUFACTURE.

[From the Bulletin of the National Association of Wool Manufacturers, September, 1894.]

INTRODUCTION.

THE following statistical history of the wool manufacture in the United States was written to accompany the special report on that industry in the Eleventh Census. Its preparation was suggested by Superintendent Porter because the Eleventh Census marked the close of the first one hundred years of the machine manufacture of wool in this country, and it seemed to him, and to others, highly appropriate that the statistical record of the industry in 1890 should be preceded by a concise review of its condition at each of the census decades embraced in this completed century of the existence of an important national industry. It seemed to the Superintendent the more desirable to incorporate such a historical sketch in the publications of the Eleventh Census, because the Tenth Census had carried very full sketches, of a similar character, relating to the development of the iron and steel manufacture, the silk manufacture, the cotton manufacture, and several of the minor manufactures, while the report on wool manufacture was confined to the bare statistical tables.

After the completion of the report and prior to its publication, there occurred a change in the office of Superintendent of the Census, Mr. Porter resigning, and being succeeded in time by Hon. Carroll D. Wright, the Commissioner of Labor. This change in the superintendency was followed by some modifications of the plans and methods of the office; and the superintendent suggested that the historical portion of the report on wool manufacture be omitted, in order to confine the text more strictly to the analysis of the statistical tables.

The suggestion was one with which the Special Agent was the more willing to comply, because it was accompanied by a courteous tender of the material or "copy," for the personal use of the author, in whatever manner he might see fit. He has concluded to give it publication in the pages of the Bulletin. As a history of the American wool manufacture, it has interest to all our readers, and its appropriate place is in the pages of a publica-

tion devoted exclusively to that industry. Some of the information here collected together has never before been published. Much of it has been lost, or as good as lost, in isolated publications, beyond the reach of any one not armed with an official search warrant for its discovery.

It should be said, however, that this sketch was purposely confined to the merest outline, without the coloring of personal opinion, as the character of an official report seemed to require. Had the writer been preparing a book for the general public which aimed to develop the history of this industry in any other than the purely statistical aspect, his work would have been very different, much more congenial, and, he ventures to think, more entertaining and more valuable. Such as it is, he believes its preservation in this Bulletin will serve a useful purpose.

The Eleven Census completes the statistical record of the first century of woolen manufacture in the United States by the factory system, as now understood and developed. As a preliminary to the present report I propose to recall briefly the features of this one hundred years of growth in wool manufacture, as revealed in the census and other statistical records, with a view of indicating the points and periods of its greatest development, the obstacles with which it has had to contend, and the deficiencies which have heretofore marked it.

A sketch of the early history of American wool manufacture appeared in the census of 1860, to which the present review is somewhat indebted, and to which it adds some materials then overlooked.

It is observable, however, that the progress of the industry since the review of 1860 was written has been much more rapid and striking than during the earlier two-thirds of the first century of its existence. In 1860 the manufacture consumed 98,379,785 pounds of greasy wool, a per capita consumption of 3.13 pounds, and the United States hardly took rank among the great wool-manufacturing nations of world. In 1890, its wool consumption approximated 434,000,000 pounds in the grease, a per capita consumption of

6.93 pounds, a consumption equal to that of France or Germany in the same year, and barely exceeded by that of Great Britain. It will thus appear that the progress of the industry since its history was last written for the census has been relatively greater than in any other country. The statistical record now presented entitles the domestic wool manufacture to a front rank among the industries of the nation.

CONDITION OF THE INDUSTRY ONE HUNDRED YEARS AGO.

Prior to 1790 this industry was almost wholly confined to the household in this country; and for many years later the great bulk of the domestic woolen goods worn by the people continued to be made in the homes, by the hand card, the spinning-wheel, and the clumsy wooden hand loom inherited from the original settlers of the colonies, who brought them to America in substantially the same shape, so far as efficiency is concerned, that they had been utilized in England and on the Continent for centuries.¹

Secretary Hamilton, in his report on manufactures, made to Congress Dec. 5, 1791, alluded to the fact that the household manufacture of wool was at that time carried on in different parts of the United States to a very interesting extent, adding, "there is only one branch of wool manufacturing which, as a regular business, can be said to have acquired maturity; this is the manufacture of hats." Speaking of the household manufacture of fabrics he said: "There is a vast scene of household manufacturing which contributes more largely to the supply of the community than could be imagined without having it made an object of particular inquiry. Great quantities of coarse cloths, coatings, serges, and flannels, linsey-woolseys, hosiery of wool, cotton and thread, coarse fustians, jeans and muslins, checked and striped cotton and linen goods, bedticks, coverlets, and counterpanes, tow linens, coarse shirtings, sheetings, towel-

¹ The fullest account of the part which the wool manufacture played in the domestic economy of the colonies will be found in William B. Weedon's *Economic and Social History of New England, 1620-1798*; see also Bishop's *History of American Manufactures*.

ing and table linen, and various mixtures of wool and cotton, and of cotton and flax, are made in the household way, and, in many instances, to an extent not only sufficient for a supply of the families in which they are made, but for sale, and even in some cases for exportation. It is computed in a number of districts that two-thirds, three-fourths, and even four-fifths of all the clothing of the inhabitants are made by themselves."

The household manufacture, interesting and important as it was, was not in any economic sense the industry with which we are now dealing. It lacked the two chief essentials of modern manufacture: the association of capital and labor, and the application of labor-saving machinery; but it was the embryo out of which factory manufacture grew, and the two were for many years so closely related and so interdependent that it was difficult, and perhaps impossible, for students and statisticians to properly distinguish between them.

During the latter half of the eighteenth century there had been in progress in Europe, and particularly in England, an industrial revolution in all the textile industries, from which the American colonies were excluded by both natural and artificial causes. After 1769, in which year labor-saving machinery was first successfully applied to wool manufacture, in the spinning of yarns, as the result of the inventions of Richard Arkwright and his predecessors, the change from the household to the factory system of manufacture proceeded with extraordinary rapidity in England, and this change had been practically accomplished in that country before it had even started in the United States.

This was due to many circumstances incident to the condition of a new country in which the primitive forms of industry naturally predominated. There were, besides, two special causes, allusion to which is essential to a full understanding of the comparative slowness with which the factory system of wool manufacture was established in the United States during the latter part of the last century and the beginning of the present.

I. It was by no means certain during any of this period that the United States could supply the necessary raw material for the manufacture of the clothing of the people.

Secretary Hamilton, in the report above referred to, says that "to encourage the raising and improving the breed of sheep at home and promote an abundant supply of wool of good quality would certainly be the most desirable expedient" for the purpose of "bringing to maturity this precious embryo" of wool manufacturing. He added that "this may not be alone sufficient, especially as it is yet a problem whether our wool is capable of such a degree of improvement as to render it fit for the finer fabrics."

The domestic wool clip at that time, while it sufficed for the coarse fabrics of the household industry, was relatively much higher priced than English wools, nor was it sufficient in quantity, nor did it possess the qualities required to form the basis of a manufacture sufficiently good to successfully compete with the English woolens, then imported to the value of over \$6,000,000 annually. There had been no rapid spread of the sheep introduced by the earlier colonists, notwithstanding many local regulations and the frequent offering of bounties. Little is known regarding the breeds of these first sheep in America. They became the progenitors of the present stock of common sheep, known as the native sheep, which have been continually modified by crosses with each other. It is certain, however, that their wools were only adapted for the manufacture of the coarse, plain, strong fabrics of household manufacture enumerated by Secretary Hamilton.

In 1785 the Pennsylvania Association for the Promotion of Agriculture offered a medal to the person who should first establish and keep within the State a flock of sheep of the true merino breed. The first introduction of the merino did not, however, occur until 1802. In that year Hon. R. R. Livingston, the American minister to France, sent home to his farm in New York State two pairs of French merino sheep from the Government flock at Rambouillet. Later

in the same year Col. David Humphreys, of Connecticut, then United States minister to Spain, shipped to the United States a flock of 100 Spanish merinos, the greater part of which arrived safely, and subsequently supplied the raw material for Colonel Humphreys' to establish the cloth manufacture at Humphreysville, Conn. Other importations were made by several gentlemen, notably in 1809, by William Jarvis, of Vermont, then the consul at Lisbon, who sent upward of 3,000 sheep of the choice breeds of Spain to his native State. It is believed that some 5,000 head of sheep reached this country during this period, and the breeds were widely disseminated through the New England and Middle States, and even as far west as Ohio.

Shortly after these importations of sheep began, the embargo and other commercial restrictions which preceded the War of 1812 turned public attention very strongly toward wool-growing, and also toward its domestic manufacture. The price of merino wool rose from \$1 a pound in 1807 to \$2 and \$2.50 during the war. It is clear that prior to the importations above mentioned the supply of domestic raw material was insufficient in character and quantity to permit of any systematic development of the wool manufacture, and that the attempts to utilize imported wools could not have been successful in competition with the British manufacturers.

The domestic production of wool in 1810 has been estimated on the basis of the census returns of that year at 13,000,000 to 14,000,000 pounds in the grease, shorn from about 7,000,000 sheep, of which Vermont had 450,000, Massachusetts 399,000, Connecticut 400,000, and Pennsylvania 1,469,000. This estimate accords fairly well with the census returns of the value of wool manufactures in the same year. In 1812 it was estimated that the domestic clip had increased to 22,000,000 pounds; and it is generally agreed that during the years of commercial restriction the improvement in the quality and the increase in the quantity of the domestic clip were greater, relatively, than at any subsequent period in our history.

II. In the second place the half century immediately preceding the organization of the federal government had been a period of extraordinary inventive progress in all the textile manufactures in Great Britain. With a full realization of the importance and value of these inventions, and with a natural desire to exclusively retain as long as possible the commercial advantages which the possession carried, the mother country had laid rigid embargo upon the exportation of any of these wonderful machines. The first of these statutes, enacted in 1774, a few years after Arkwright's successful inauguration of the factory system with his new appliances, was entitled "An act to prevent the exportation to foreign parts of the utensils made use of in the cotton, linen, woollen, and silk manufactures of this kingdom;" and its purpose, as set forth in the preamble, was "to preserve as much as possible to His Majesty's British subjects the benefits arising from these great and valuable branches of trade and commerce." The statute prohibited, under penalties of forfeiture and heavy fines, "the putting on board of any ship or vessel, not bound to some port or place in Great Britain or Ireland, of any tools or utensils commonly used or proper for the preparation, working up, or finishing of the cotton, woollen, silk, or linen manufacture." Another statute, even more stringent, was enacted in 1781, by which a year's imprisonment was added to the penalties of forfeiture and the fine of £200 previously imposed. This policy was rigorously enforced, notwithstanding some modifications of the law in 1825, and again in 1833, until the year 1845, when machinery for the textile manufactures was for the first time omitted from the list of prohibited exports from England.

No known instance occurred during the earlier decades of the existence of these laws, in which a perfect textile machine was smuggled into this country. Some few models were clandestinely introduced, but they were of so imperfect a character that it may literally be said that the United States was compelled to invent anew the machinery with which, gradually, and after a most trying probation, her textile in-

dustries were finally established. The more remarkable, therefore, is it that this country learned so quickly how to clothe itself, and maintained and developed a great woolen industry in the face of a nation which had such a tremendous start in the race.

PREVIOUS CENSUSES OF WOOL MANUFACTURE.

The only statistical record we have of the development of wool manufacture in the United States is that contained in the several federal census reports; and for the first half century of our history as a nation the data contained in these reports are incomplete and unsatisfactory.

No attempt to record the industrial resources and progress of the nation was made by the census prior to the year 1810. Necessarily in that year the statistics were gathered in a most desultory and unsatisfactory manner.

The statistics of 1820 were not more satisfactory, and so little reliance was placed upon them that in 1830 all effort to record the industrial condition of the country was abandoned.

The census of 1840 again contained statistics of the woolen manufacture, as did also the censuses of 1850 and 1860. Not until the census of 1870, however, did the Census Office begin to gather these industrial statistics in a manner which justifies any great reliance upon their credibility; and the special investigation upon this subject, made by George William Bond in the census of 1880, is the first upon which we can fairly depend as representing in a trustworthy manner the actual condition of this particular industry at the time it was taken.

At the beginning of the century the American people were practically dependent upon Great Britain for all the woolen goods they wore outside of the products of a purely household industry. How important the American trade was to the woolen manufacturers of the mother country, and how large a proportion it comprised of all the woolen goods worn by the people of this country, is shown by the following

table taken from Brothers' History of Wool and the Woollen Manufactures of Great Britain,¹ which indicates the total British exports of woollen goods for the last ten years of the eighteenth century, with the proportion exported to the United States :

STATEMENT SHOWING THE PROPORTION OF ENGLISH MANUFACTURES OF WOOLENS EXPORTED TO THE UNITED STATES FROM 1790 TO 1799.

YEARS.	United States.	All parts of the world.	Percentage to United States.
1790.....	£1,481,378	£5,190,637	28.54
1791.....	1,621,796	5,505,034	29.46
1792.....	1,361,753	5,510,668	24.71
1793.....	1,032,954	3,806,536	27.14
1794.....	1,391,877	4,390,920	31.70
1795.....	1,982,318	5,172,884	38.32
1796.....	2,294,942	6,011,133	38.18
1797.....	1,901,986	4,936,355	38.53
1798.....	2,399,935	6,499,399	36.93
1799.....	2,803,490	6,876,939	40.77

It is clear from the action of Congress in levying its first duties upon imported articles in 1789, that at the time of the organization of the federal government the United States was not regarded by her own people as in any economic sense a wool-manufacturing country, or as likely to dispute, for years to come, the acknowledged supremacy of Great Britain in that peculiar field of industry. While certain of the duties upon imported goods imposed by the first tariff act of July 4, 1789, were intended to be protective in their character, and were imposed for the avowed purpose of the "encouragement and protection of manufactures," the duty of 5 per cent. established upon all manufactures of wool was not intended as a protective duty, and was not expected to result in building up a domestic woollen manufacture. In the debates that preceded the adoption of this measure the

¹ Samuel Brothers, "Wool and Wool Manufactures of Great Britain," page 144.

subject of wool manufacture was hardly mentioned, nor was there any recognition of the existence of a domestic manufacture which could be promoted or extended by impost duties.

EARLY ADVENTURES IN WOOL MANUFACTURING.

Nevertheless, attempts to establish such an industry had already taken place in an earnest and even heroic fashion. That of the Hartford (Connecticut) Manufacturing Company was perhaps the most notable. It was inaugurated in 1788 by means of a subscription paper circulated in Hartford, Windsor, Farmington, Weathersfield, and Middletown. The capital proposed was £1,250, in 125 shares of £10 each, and at the head of the thirty-one subscribers was Col. Jeremiah Wadsworth. The company was organized on May 2 of that year, and the General Assembly of Connecticut passed a resolution exempting the manufactory from any tax or assessment on the buildings it used for the term of five years. It also exempted all persons who constantly labored in the manufactory from the payment of a poll tax for a period of two years. By January, 1789, cloth enough had been made to justify placing it upon sale. These cloths were not of bad quality in view of the ramshackle machinery and unskilled labor employed and the poor quality of the raw material. But English goods, after paying the duty of five per cent. undersold them in the town where they were made, and gave much better satisfaction besides.

Dec. 10, 1794, the Hartford company announced a dividend of 50 per cent. on the original shares, to be paid in the finished goods of the company, and this was the first and only dividend paid until the closing of the manufactory on Aug. 24, 1795. At that date the company announced that the time had expired for which the proprietors had engaged to pursue the business, and that a final settlement of the concern had become necessary. The property was subsequently sold at auction, and consisted of forty pieces of finished goods, 4,000 pounds wool, eight looms, two hand

carding machines, one spinning jenny, one twisting machine, and other implements, dyestuffs, etc.

The experience of the Hartford Woolen Company was not greatly different from that of several other experiments in the same direction at about the same time. About 1789 a woolen mill with about the same capacity as that at Hartford commenced operations at Stockbridge, Mass., and in 1790 another at Watertown. So that at the time of the First Federal Census, that which begins the century of progress which the Eleventh Census closes, there were but three woolen factories (using that term in the sense that we now use it, and excluding the neighborhood carding and fulling mills) in the whole United States. They had a capacity of about 15,000 yards per annum, and their product was estimated to be worth \$75,000.

In 1794, the first woolen factory operated by power was established at Byfield, Mass., with Arthur Scholfield, and other English operatives, in charge. By common consent, the establishment of the Byfield mill is now accepted as the true date of the founding of the factory manufacture of wool in the United States. Up to that time the carding of wool had everywhere been done by means of the hand card. As the carding is the initial step in the manufacture, and as hand-carding necessarily makes uneven yarn, resulting in imperfect cloth, the introduction of the carding machine properly determines the establishment of the wool manufacture by machinery among us. The first carding machine at Byfield was made with a single cylinder, after which two double machines, with two cylinders, were made, and the three machines placed in the Byfield factory, where they were tended by James Scholfield, then eleven years old.

EFFECT OF THE EMBARGO AND WAR OF 1812.

Little or no further advance in the woolen manufacture, either in quantity or quality, occurred in the United States until a period just prior to the embargo of 1807. The embargo was followed by the non-intercourse act of 1809, and

the war with England in 1812, during which all commercial intercourse was prohibited, and the import duties doubled. When the people of the United States were thus suddenly compelled to manufacture a large variety of articles which they had heretofore chiefly or largely imported, they proved themselves abundantly able. During the five years prior to the War of 1812 there was no industry so prominent in the public eye as the manufacture of wool. Domestic manufacture in the family by the hand loom began to be supplemented by the associated effort and improved machinery of the factory. The fame of the new merino flew from farm to farm, and as fleeces grew heavier, and as prices advanced, the finest rams of this stock commanded, in some cases, \$1,000 each. Factories were built, surplus farm labor was diverted to the mills, thus raising the price of rural labor, making a market for superabundant produce, and inspiring hope and confidence, resulting, in 1810, in a product of wool manufactures to the value of \$25,608,788, according to the figures returned by the census of that year. This value included both the factory product and the household manufactures of wool. The census reported the existence of twenty-four woolen factories, and fulling mills to the number of 1,682, of which 427 were located in New York and upward of 200 each in Massachusetts, Connecticut, and Pennsylvania. The number of yards of cloth fullered was stated at 5,452,960, with a value of \$4,117,308.

Of the twenty-four woolen factories in existence, four mills, including the three above named and one at Pittsfield, Mass., were the only establishments engaged in making fine cloth. Of the remainder nine, making coarse cloths, had an annual capacity of about 10,000 yards each, and the factory product of cloth was estimated at 200,000 yards, worth from \$1 to \$10 a yard. The estimate of woolen cloth made in families in that year was 9,528,266 yards, so that the factories produced about one-fiftieth of the total product of the country. The value placed upon the total product, \$25,608,788, was an average value of about \$2.65 per yard.

At the outbreak of the War of 1812, factories for making army and navy cloths, blankets, negro cloths, and broad-cloths, the great staple woolen manufactures of that time, sprang up in different parts of the country, stimulated by the enormous rise in the price of these necessities. Broad-cloths are said to have sold readily at \$8 to \$12 a yard. Many cotton mills were diverted to the manufacture of woolen goods.

This period was also notable for the first introduction of steam into American woolen mills; and the spinning jenny, first introduced in America at the Peace Dale (Rhode Island) factory, in 1804, began to be commonly used. This multiplication of woolen factories continued up to the year 1815 and the close of the war. The State of New York granted no less than twelve charters for woolen factories during the year 1812.

One accompaniment of this extraordinary activity in manufacturing was particularly notable. Allusion has been made to the impossibility of obtaining machinery and models from England, by reason of the rigid embargo of that country. The result was to stimulate original inventions, many of which were of great and permanent merit. Two hundred and thirty-seven American patents were issued in 1812, a large proportion covering apparatus for spinning, weaving, and other processes in the manufacture of wool, cotton, flax, and linen. Notable among them was a portable or family spinning frame, invented by Rev. Burgiss Allison, of Philadelphia, which carried ten or twelve spindles, and spun wool to any fineness required. Improvements in the loom were also numerous, and the experiments with power looms now begun by Francis C. Lowell led ultimately to the construction of the first successful American power loom, put into operation on cotton goods at Waltham, Mass., in 1816. The Lowell power loom was, however, preceded by the power loom invented by Thomas R. Williams, of Rhode Island, for weaving saddle girths and other webbing, for it is stated by Mr. Roland G. Hazard that these looms were

started at Peace Dale, probably in 1813, certainly not later than 1814. After they had been fully tested, Roland Hazard purchased four of them for \$300 each, and in 1814 or 1815 they were in successful operation. The date of the starting of these four looms is fixed by the fact that with the money obtained by their sale to Roland Hazard, Thomas R. Williams bought a site and erected a mill at Rocky Brook, near Peace Dale. This purchase is known to have been made in the fall of 1815. It has been claimed that power looms were first started at Judge Lyman's woolen mill in North Providence in 1817. Peace Dale antedates this at least two years, and claims to be the place where the first power looms were successfully operated on woolen goods in America, if not in the world.¹ Nearly all the machinery employed in the factory manufacture of wool during the first quarter century of our national existence was not only of domestic construction but of domestic invention as well.

Nor should we overlook in this connection the remarkable invention of Amos Whittemore, of Massachusetts, of the machine for the manufacture of cotton and wool cards, patented in 1797, described in a Congressional report as a splendid specimen of "construction, precision of movement, rapidity of performance, and perfection of execution," a machine which was the genesis of all mechanical contrivances for making card clothing, and an invention which materially assisted in promoting the extension of both the woolen and cotton manufacture in this day of its struggling infancy.

THE REACTION AFTER THE WAR.

At once upon the declaration of peace at Ghent, the importation of English woollens was resumed, and the young industry, which had been suddenly created by the war, was as suddenly prostrated. The total value of woollens and cottons imported in the fiscal year 1816 was about \$70,000,000,

¹ Samuel Batchelder, in his "Introduction of the Cotton Manufacture in the United States," says: "Immediately after the power-loom was put into operation at Waltham measures were in progress for its introduction into Rhode Island from a difficult source and of a different construction."

paying an ad valorem duty of 5 per cent. Mills all over the country went to the wall, their proprietors finding that whatever progress they had been able to make in the manufacture during their eight years' possession of the home market still left them far behind the English in the quality of their fabrics.¹

They found themselves handicapped in every direction. There was a distressing lack of a domestic wool supply of the qualities required for better grades of goods. There was a great scarcity of superior workmen trained to the manufacture and familiar with its niceties. Their machinery was far inferior to that of their foreign competitors, not only in its capacity for rapid work, but also in the quality of the product it produced. There naturally followed a swift revival of the old preference for foreign goods, which had disappeared under the patriotic sentiment aroused by the war, and had been preached against by governors in their messages, and practised against by the habit of Presidents, Congressmen, and whole State Legislatures, of appearing in garments proclaimed to be wholly of domestic manufacture. Secretary Gallatin reported that two-thirds of the clothing worn by the American people at this time, outside of the cities, was of household manufacture. But contemporary annals make it evident that the close of the war was followed by a species of craze for the purchase of foreign goods, which were crowded into the country at prices which seemed phenomenally low in comparison with those recently paid for domestic goods. It was a veritable reaction, and the wool manufacture was in a position to suffer the severest effects from it. Between the competition of the household products on the one hand, and the foreign goods on the other, it found itself stranded. Many of the manufacturers had rushed into the business, stimulated by the extraordinary rewards held out, with little or no knowledge of the methods and requirements of the manufacture, with insufficient capital, and with loose

¹ The revulsion in the industry of wool-growing was equally complete. At this time full-blooded merinos sold for \$1 apiece. Bucks had been sold during the war for \$1,000 apiece. Wool did not materially rally in price for the nine succeeding years, and during that period most of the full-blood flocks of the country were broken up or adulterated in blood. — *Randall's Practical Shepherd*, page 21.

and unbusiness-like methods. All the circumstances warrant the belief that the contemporary records of the suffering and disaster which now befell them are not exaggerated. In this emergency the wool manufacturers turned to Congress, and the result of their representations, and those of other manufacturers, particularly the cotton manufacturers, was the passage of the tariff act of 1816.

THE TARIFF AND THE WOOL MANUFACTURE.

The unfortunate experience of the wool industry following the close of the war has been so frequently duplicated in the history of the industry in this country as to attract the attention of all economic writers on the subject. The relations of the industry to the tariff have been held in some quarters to afford a partial explanation of these recurring waves of prosperity and depression. Others have insisted that they have been merely the reflex of the commercial condition of the country, and equally characteristic of every industry. The discussion of this question is beyond the purview of this report. Nevertheless no review of the history of the industry in the United States can ignore the fact that the woollen manufacture has been more closely associated with tariff legislation, and with trade conditions determined by that legislation, than any other industry. It is the only considerable American textile industry that has been subject to duties upon its chief raw material or that has been dependent for its supplies of that raw material, in such large degree, upon both foreign and domestic sources. For this and for other reasons the statistical and legislative history of the industry blend and run into each other at every point, and it is impossible to fairly present the one without frequent reference to the other. It is necessary in any intelligent survey of its development to state the character of the tariff legislation affecting it from time to time. It has been the endeavor of the special agent making this report to divest his statements regarding the tariff of any color imparted by preconceived opinions regarding the advantages

or disadvantages of protective duties in connection with the development of the woolen manufacture in the United States. Allusions to the tariff in this report are confined to the bare historical presentation of all the elements which have had to do with the development of the industry at any stage or period.

CONDITION OF THE INDUSTRY IN 1816.

A number of petitions from wool manufacturers in all parts of the country preceded the passage by Congress of the tariff act of 1816. In these petitions it was stated that there was invested in the woolen manufacture in 1816, \$12,000,000, and that the factories consumed in their manufacture \$7,000,000 worth of wool. They placed the value of the woolen goods manufactured at this time at \$19,000,000 (exclusive of the domestic industry), and the number of persons regularly employed at 50,000. These figures were undoubtedly exaggerated, but they serve to show that a most extraordinary development had distinguished the woolen manufacture since 1810.¹

On March 6, 1816, the House Committee reported on these petitions that the wool manufacture was entitled, from its progress, promise, and nature, to the same degree of consideration as the committee had accorded, in a previous report, to the cotton manufacture. By the law that was subsequently passed, the duty on woolen manufactures, except blankets, rugs, and worsted or stuff goods, was fixed at twenty-five per cent. for three years from June 30. The minimum principle by this act for the first time applied to cotton cloths, and which was, in effect, a specific duty of six and a quarter cents a yard, was not applied in the woolen schedule. So that, while nominally the degree of protection accorded the two industries was the same, it was not in fact

¹ Messrs. Arthur W. Magill and William Young, whose estimates were accepted by the House Committee of Ways and Means, stated, in a letter to the chairman, that twenty-five establishments were then engaged in the manufacture of woolen cloths in Connecticut alone, employing 1,200 persons, besides as many more hands indirectly. Their capital was \$450,000, and they probably made 75,000 yards of narrow and 25,000 yards of broadcloths. As many as 500,000 yards were supposed to be made annually in families. The manufacture was capable of an increase throughout the Union of 25 to 30 per cent. per annum.

the same. By this act wool was for the first time made dutiable, a uniform rate of fifteen per cent. being fixed.

The act of 1816 was based upon the report of Alexander J. Dallas, Secretary of the Treasury, who suggested three classifications of manufactures, according to the degree of their production in the United States. In Class one he grouped the articles of which the home supply was equal to all the demands of the country. Class two contained the articles which could only be produced in part, and Class three articles but slightly grown or produced here, or not at all. For Class one he suggested a standard of thirty-five per cent. duty. For Class two, which included woollens and cottons, the proposed rates varied from twenty per cent. on iron to twenty-eight upon woollens and thirty-three and one-third on cottons.

The general condition of both these textile industries remained most unsatisfactory to those engaged in them. A duty of 25 per cent. upon woollens, accompanied by a duty of 15 per cent. upon the raw material, involved no very drastic protection. Petitions soon began to pour in upon Congress again, complaining of the inadequacy of the law of 1816, and praying for a new measure of relief. These petitions came from Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, New Jersey, and Maryland. They were largely signed, often forcible in statement and sometimes pathetic in their appeal. One petition from Oneida county, New York, is fairly typical of them all. It stated that that county contained a greater number of cotton and woolen manufactories than any other in the State, and that \$600,000 was invested in them. "In spite of the utmost efforts of their proprietors, more than three-fourths of them remained closed, some of their owners having been wholly ruined and others struggling under the greatest embarrassments." They could not believe that the Legislature of the Union "would remain an indifferent spectator of the widespread ruin of their fellow-citizens, and look on and see a great branch of industry, of the utmost importance in every community, pros-

trated under circumstances fatal to all future attempts at revival, without a farther effort for relief."

1816-1820.

Such was the general condition of the wool manufacture, barring a perceptible revival in 1819, when the census of 1820 was taken. The returns for manufactures made at this census were so incomplete and fragmentary that no attempt was made to statistically present them. In the year 1823 the State Department, in response to a resolution of Congress, did prepare an abstract of these returns without any attempt at their analysis. They have been regarded as of little value as indicating the condition of any of the manufacturing industries of the country at that date. There were whole counties in several States from which no returns whatever were received. Nevertheless a study of these returns throws a good deal of light upon the conditions of manufacturing which then prevailed, and the returns have a historical value not heretofore appreciated.

They indicate very clearly the conditions surrounding the manufacture of wool in several States. They show that this manufacture was confined exclusively to fabrics variously denominated as broadcloths, narrow cloths, plain cloths, cassimeres, satinets, kerseys, kerseymeres, flannels, and blankets, and to the fulling and dressing of home-made cloth and the carding of rolls and the spinning of yarns for household manufacture.

The relative quantity of these fabrics made was about in the order they have been named above. The broadcloth mills were the most common, but nearly all of them made also cassimeres and satinets.

The broadcloths were valued at from \$2.50 to \$7 per yard, and in some instances at \$10 per yard. The narrow cloths were valued at from \$1.12½ to \$1.75 per yard, and the satinets from \$1.50 to \$3 per yard.

Comparatively few flannels were made, and even fewer blankets, the bulk of these goods being then supplied by im-

portations. The kerseys were a coarse cloth having the characteristics of the English say or serge, and the kerseymeres were a finer grade of these cloths.

The manufacture of hats represented nearly as much capital as the manufacture of broadcloth, and the largest and most prosperous of the establishments engaged in woolen manufacture were those making hats. They employed wool and fur in about equal proportions.

The largest cloth mill then in existence in the country, so far as these returns indicate, was located in Massachusetts, and employed a capital of \$47,825. It placed a value of \$35,676 upon its product, which consisted of broadcloths and cassimeres. These products were manufactured from 43,700 pounds of wool and 3,300 pounds of cotton, which were represented as having cost \$18,764. The establishment employed 46 men, 23 women, and 23 children, and paid annually \$10,594 in wages. Its contingent expenses of operation were stated at \$3,918. The amount paid in wages, averaging \$115 per annum to men, women, and children, confirms the common belief that wages were as low in the United States as in England at that time.

The return for this establishment contains a statement of the machinery in use which supplies a picture of a woolen mill of the best character in those days. This machinery consisted of four carding engines, one picker, three jeannies, 516 spindles, one roper, six broadcloth looms, and two cassimere looms. The finishing machinery was not enumerated, but the primitive character of this typical woolen mill of 1820 is graphically illustrated by this enumeration of its other contents.

Another Massachusetts mill employed three carding engines, one jack, two jennies of 140 spindles each, and annually converted 4,000 pounds of wool into broadcloth and satinets.

Another Massachusetts mill making broadcloths and cassimeres, valued its products at \$15,181, which it manufactured from 12,000 pounds of wool and of cotton yarn, costing \$8,000. Its capital was \$32,000, and it paid \$5,070 in wages to 9 men, 18 women, and 7 boys. Its equipment was re-

turned as 4 carding engines, 5 spinning jennies, one roper, 3 shearing machines, 1 falling-stocks, and 19 looms.

These were large mills for the time. The great bulk of the mills from which reports were obtained were one-set mills, and valued their products from a few hundred dollars up to the neighborhood of \$10,000.

There is a close similarity in all the reports between the value of the goods reported and the quantity and cost of the raw material consumed. The average cost of the wool employed was about 40 cents a pound, and the value of the product about double the cost of the raw material used.

Accompanying the returns of these woolen mills are the comments of their owners or the agent making the return upon the condition of this branch of manufacturing at this time. Almost without exception they reported their business as unsatisfactory. Many of the mills were apparently partially idle and a number of them wholly so. Others reported a fair demand for their goods, but at prices which left little or no margin of profit for the manufacturer.

1820-1830.

No census of manufacturing was attempted in 1830, and our knowledge of the advance of the wool manufacturing industry during the previous decade must be drawn wholly from the petitions and memorials presented to Congress and from private sources.

Mr. J. Leander Bishop, in his *History of Manufactures*, states that the "fixed and floating capital" invested in the woolen manufacture was "about \$40,000,000 in 1830;" but this statement we are obliged to dismiss as an imaginary estimate, as well as his further remark that the number of persons employed was 162,000. More than this number of persons worked in wool, for the spinning-wheel and the hand loom were utensils in active use in nearly every rural family. But such figures have no relation to the manufacturing of wool as a factory industry, with which Mr. Bishop was dealing.

Indeed, it is clear that prior to this decade, 1820-1830, the establishment of a factory manufacture of wool had not been generally contemplated by the American people, and the debates upon the tariff of 1816 are full of disclaimers of the intention to introduce a system of factory manufacturing. The household industry was still of great and increasing importance, particularly in woolen fabrics, and Mr. Niles urged that the industrial independence of the new nation was to be accomplished by reliance chiefly upon these household industries.¹ There existed on the part of the people a strong prejudice that factory life was derogatory to health, morals, and the general intelligence of the communities in which the mills had taken root. This prejudice had its origin in the knowledge which was already abroad of the demoralizing surroundings of factory life in England, particularly in reference to child labor and unsanitary conditions. This prejudice remained for many years an intangible but effective obstacle in the way of the rapid establishment of the textile industries among us.

But in the meanwhile the manufacturing interests were becoming steadily more diffused and better organized, and each Congress that assembled was called upon to consider some measure looking to their further encouragement and extension. In 1819 there had come upon the country a new commercial crisis, due primarily to the close of a generation of war in Europe. Out of the falling prices and hard times which accompanied this financial disarrangement there gradually arose a strong public sentiment in favor of more effective protection to home industries than had heretofore existed. The attempt to increase the duties on textiles made in 1820 failed for the want of a single vote in the Senate; but in 1824 a tariff act was passed which increased the duties on woolen goods, on the avowed ground that the act of 1816, while a moderately protective measure, had failed of the purpose to insure the domestic manufacture against the consequences of the better organized competition of England. This tariff fixed the duties on all woolen goods (except

¹ Niles' Register, 9: 2, 12, 24, 268; Annals of Fifteenth Congress, first session, pages 84-88.

worsted stuff goods and blankets, which paid 25 per cent. ad valorem) at 30 per cent. until June 30, 1825, after which they were to pay a duty of $33\frac{1}{3}$ per cent.

The act of 1824 proved quite as unsatisfactory to the woolen manufacturers as that of 1816, and for a reason economically sound.

In fixing duties of 25 and $33\frac{1}{3}$ per cent. on woolens, it imposed a duty of 15 per cent. on wool costing under 10 cents a pound, and on wool costing over that sum 20 per cent. until June 1, 1825, 25 per cent. until June 1, 1826, and afterwards a duty of 30 per cent. The manufacturers insisted that a law making an increase of 15 per cent. in the duty on wool, accompanied by an increase of but 8 per cent. on woolen goods, was so contrived as to work the greatest embarrassment to the manufacture, and the event proved that they were right. The domestic clip of wool was wholly insufficient for the requirements of the manufacturers, and but little of it was suitable for the finer class of goods. More than one-third of the wool they then manufactured was imported from abroad, and the difference in the cost of the raw material, in England and in the United States, ranged from 50 to 70 per cent. The disadvantage thus increased was further accentuated by the action of Great Britain, which shortly after the enactment of the tariff of 1824 reduced the duty on wool from sixpence a pound to one penny, and later to a halfpenny, a step taken to enable the English manufacturer to continue his command of the American market, which was still, as it has long been, worth nearly as much to Great Britain as all her other markets combined. In 1822, according to James Bischoff,¹ the exports of woolens from Great Britain were as follows:

TO	Cloths of various kinds. (Pieces.)	Stuffs. (Pieces.)
European countries.....	65,974	336,166
United States	145,600	302,944
Other countries	103,378	253,249

¹ Bischoff: "History of the Woolen and Worsted Manufactures, 1842."

The Treasury reports indicate importations of foreign wools in the year 1828 aggregating 2,453,392 pounds¹ and valued at \$491,945, and this quantity decreased to 669,883 pounds in 1830, rising again to 5,622,000 pounds in 1832. Of the imports of 1828, 367,230 pounds came from South America, and most of the remainder (2,006,907 pounds) from European countries, England, Portugal, Spain, and Germany, the fine wools of these countries, and 594,520 pounds of the coarse wools of Turkey.

The domestic clip of the year 1830 has been estimated at 17,829,000 pounds. The supply of this domestic wool generally came from the immediate neighborhood in which a mill was located. Thus the Massachusetts mills were supplied from western Massachusetts, Connecticut, New Hampshire, Vermont, New York, and partially from Pennsylvania and Ohio. Many of the manufacturers who testified before a congressional committee in 1828 were themselves wool-growers, and they confirmed the statement that at the prices paid them for their fleeces the industry was not a profitable one.

The tariff of 1824 did not result in any increase in the domestic wool clip, although it was followed by a movement for the establishment of the fine-wool industry in the United States, which was pushed with great zeal for several years. The importation of Saxon merino sheep began in great numbers,² and the popular craze was still further stimulated by the tariff of 1828, increasing the duty on all wool, of whatever value, to four cents a pound and 40 per cent. ad valorem. There sprang up a mania for the production of fine wool, regarding which Mr. Randall says: "Every producer strove to obtain the finest, regardless of every other consideration. Size, weight of fleece, and constitution were totally overlooked."³ Of the consequences of this mania, Mr. Randall further writes: "Yet the grower was feeding on hope. Fine wool did not rise to a high price until after the middle of 1830, and neither then nor at any subsequent

¹ This is a Treasury Department estimate.

² Henry S. Randall's report in New York State Agricultural Society's Transactions, 1841.

³ "The Practical Shepherd," by Henry S. Randall, page 25.

period did the average price of Saxon exceed that of Spanish wool by more than 10 cents a pound, while at least a third more of the latter could be obtained from the same number of sheep, or the same amount of feed. When we consider this fact, and consider the superiority of the Spanish sheep in every other particular except fineness of wool, we cannot sufficiently wonder that from 1824 to 1840 the Saxons should have received universal preference, have sold for vastly higher prices, and that those who owned Spanish sheep should have made haste to cross them with their small and comparatively worthless competitors. In about 1840, however, a reaction commenced, and the tariff of 1846 (which established an even *ad valorem* duty of 30 per centum on all wools and on cloths) completed the overthrow of the Saxons."

The anomalous relation of the duties on wool and woolens in the tariff of 1824 soon led to an organized movement among the wool manufacturers for relief. At a meeting in Boston, toward the close of 1826, a petition to Congress was adopted which pointed out this anomaly. This petition, while admitting that a duty of $33\frac{1}{3}$ per cent. would ordinarily operate in favor of the domestic manufacture, declared that by reason of the relatively higher duties on the raw material "the fact of the unprecedented depression of American woolen manufacturing establishments was undeniable." The petition was extensively signed throughout the country, and it resulted in the introduction of a bill on January 10, 1827, in conformity with the desires of the manufacturers. The *ad valorem* rates on woolen goods were not proposed to be changed by this bill, but four minimums were established, in imitation of the minimum principle applied to cotton goods. All woolens, whose actual value at the place whence imported was 40 cents or less per square yard, were to be dutiable as though costing 40 cents; between 40 cents and \$2.50, at \$2.50; between \$2.50 and \$4, at the latter figure. The duty on raw wool was to be advanced to 35 per cent. after June 1, 1828, to 40 per cent. one year later, and wool costing between 10 and 40 cents per pound was dutiable as costing 40 cents. This bill passed the House without very decided opposition,

but was defeated in the Senate by the casting vote of Vice-President Calhoun. The failure of this measure, which related solely to woolens, resulted in a renewed agitation for tariff legislation, which was fostered by the Harrisburg convention¹ of June, 1827, and finally resulted in the enactment of the tariff of 1828. This tariff, so far as it related to wool and woolens, was based upon the defeated bill of 1827. It was notable for the wide introduction of the specific form of duty. It fixed the duty on raw wool at 4 cents a pound, and in addition, 40 per cent. ad valorem in 1828, 45 per cent. in 1829, and thereafter 50 per cent. The cheap coarse wools which had been admitted free of duty by the tariff of 1816 were by this law weighted with a heavier duty than the fine wools, by reason of the operation of the specific form. These wools were costing at that time in Asia Minor and South America from 4 to 10 cents a pound. At the same time the law retained the low rate of 25 per cent. duty on the coarse woollen goods manufactured from these cheap wools that had existed under the law of 1824, and thus the anomaly complained of by the manufacturers, in respect to the act of 1824, was continued and increased under the act of 1828, so far as this branch of the manufacture was concerned. The duties on woollen goods, as finally fixed, were as follows:

On manufactures of wool, or of which wool shall be a component part (except carpetings, blankets, worsted stuff goods, bombazines, hosiery, mits, gloves, caps, and bindings), the actual value of which, at the place whence imported, shall not exceed 50 cents per square yard, shall be deemed to have cost 50 cents the square yard, and be charged

¹ The following is an extract from the address of this convention: "It is manifest to your committee that the growers and manufacturers of wool are suffering great pecuniary loss and ruinous embarrassment from the pressure of circumstances which threaten the general destruction of interests whose annual product, in sheep and manufactures of wool, would amount to the sum of \$50,000,000, and probably had reached that value. The committee can not believe that these circumstances are of a temporary character. They think the time has arrived when the vast capital, exceeding \$80,000,000 and perhaps amounting to the great sum of \$100,000,000 vested in or variously applied to the breeding of sheep and manufacture of woolens, will be exceedingly diminished and lost to the national wealth, and a very numerous population, dependent on these branches of national industry, be dispersed if protection by the national legislature shall be longer delayed, for it is an unquestionable fact that many of our best and most economically conducted woollen factories are really losing concerns, not affording even the ordinary interest obtained on capital not earned in this business, but diverted to it from other pursuits, that it might have circulation and be made useful to its possessors and the public." — *Niles' Register*, Aug. 11. 1827.

thereon with a duty of 40 per centum ad valorem, until June 30, 1832, and from that time a duty of 45 per centum.

Manufactures of wool, except flannels and baizes, the actual value of, etc., shall not exceed $33\frac{1}{3}$ cents per square yard, pay 14 cents per square yard.

Manufactures of wool, etc., actual value exceeding 50 cents per square yard, not exceeding \$1 the square yard, shall be deemed to have cost \$1 the square yard, and be charged thereon with a duty of 40 per centum ad valorem to June 30, 1829, and from that time a duty of 45 per centum ad valorem.

Manufactures of wool, etc., value exceeding \$1, and not exceeding \$2.50 per yard, shall be deemed to have cost \$2.50 per square yard, and be charged with a duty thereon of 40 per centum to June 30, 1829, and from that time a duty of 45 per centum.

Manufactures of wool, etc., value, etc., exceeding \$2.50, and not exceeding \$4 per square yard, shall be deemed to have cost at the place whence imported \$4 per square yard, and a duty of 40 per centum shall be levied, etc., until June 30, 1829, and from that time a duty of 45 per centum.

Manufactures of wool, etc., the actual value of which, etc., shall exceed \$4 per yard, a duty of 45 per centum ad valorem until June 30, 1829, and from that time a duty of 50 per centum.

This detail regarding the tariff legislation of the decade under consideration is essential to an accurate understanding of the peculiar economic status of the wool manufacture during that ten years. During the entire period it labored under a false adjustment of the duties on material and product, and in consequence it was affected by a continuous agitation, looking to the change of the tariff. At no period in its history have the conditions surrounding the manufacture been more trying than during those ten years. The difficulties heretofore alluded to, as incident to their surroundings, were none of them so serious as those which arose from the absence of a fixed and logical economic status engendered by these falsely constructed laws.

It is not surprising, therefore, that the actual progress of the industry in this decade was relatively less than in any other in our history. No statistical data exist whereby to establish the fact, but it is confirmed by all the evidence accessible. It is particularly noticeable in contrast with the progress of the American cotton manufacture during the same

period. Favored by an abundance of home-grown raw material, and particularly favored by a minimum proviso in the tariff which gave them the command of the home market, the cotton mills multiplied, and their projectors prospered. Even at this early date it began to be recognized that the American coarse cottons were as good as the British fabrics, if not better.¹

Just the contrary was true regarding the manufacture of wool. While there was a marked improvement in the quality and finish of domestic woolen goods during this period, they still remained generally inferior to those imported, and the popular prejudice in favor of the latter did not in the least abate.

Mr. George William Bond, who enjoyed the advantage of a personal acquaintance with many of the wool manufacturers of that era, has summed up the situation as it then existed, as follows :

The increased demand for wool, consequent upon the increased number of mills, became so great that the manufacturers had to go into the country at clip time to secure their supply for the year. This could be bought only for cash. To enable them to do this, many were obliged to mortgage their mills and machinery to their selling agents to obtain acceptances on which they could borrow the money. The clip of the country was still insufficient. The importation of wool and woollens continued under a tariff which was only nominally protective. Sooner or later nearly all of them failed, and their agents were obliged to take possession under their mortgages, many of whom soon went through the same experience.

The importations of woolen goods during this decade began at \$7,238,954 in 1821, and were about the same (\$7,193,653) in 1829; but in the years 1822 and 1825 they reached the enormous totals of \$11,752,505 and \$12,017,468 respectively. The value of the mill products of woolen goods in 1830 was estimated by a congressional committee at \$14,528,166. The most careful investigation of all the data at hand warrants

¹ Niles' Register, 22: 225; 24: 243.

the conclusion that fully one-half of the consumption (exclusive of the products of the household industry) was of foreign origin.

An analysis of the imports entered for consumption in 1828 shows the characters of the foreign importations. Thus the blankets imported were valued at \$624,239, an amount which confirms the statement made before the congressional committee that it was impossible to manufacture blankets in the United States, under existing conditions, in competition with foreign countries. No blankets, except a few of the coarsest description for the use of the negroes in the south, were made at this time, the price of native wool being too high (25 to 28 cents) to warrant the undertaking. This fact is the more striking because the manufacture of blankets is very simple, easy, and cheap, the material being the greater part of the expense of manufacture. The duties collected on these importations of blankets were \$156,059, an average ad valorem rate of 25 per cent.

The imports of carpets were valued at \$581,946, duties \$222,192, and they represented practically the entire consumption of the country.

The importations of cloths and cassimeres were valued at \$4,315,714, and they paid duties amounting to \$1,437,132, an average of 33 per cent. The importations of dress and piece goods, commonly called "stuffs," for women's wear, were valued at \$1,609,030, paying duties of \$410,102, or 25 per cent. The manufacture of this class of goods had not been undertaken, at that time, in the United States, and the importations represented the entire consumption of our people.

These statistics are the best evidence that can be cited to test the soundness of the claim so frequently iterated during the decade in the petitions and memorials of the manufacturers that existing conditions did not permit of a successful domestic competition.

We A full insight into the internal condition of the wool manufacture of this time is afforded by the testimony given in January, 1828, before the House Committee on Manufactures

by a number of the leading manufacturers of the country. The following is a summary of this testimony:

S. Newton Dexter, of the Oriskany Manufacturing Company, Whitesboro, New York, commenced 1810, making kerseymeres and broadcloths. Hon. A. Tufts, of Tufts Manufacturing Company, Dudley, Massachusetts, commenced 1824, capital, \$40,000; loss, exclusive of interest, in eighteen months, \$5,000. Colonel James Shepherd, of Shepherd Woolen Manufacturing Company, Northampton, Massachusetts (the largest in the United States), capital, \$130,000; made broadcloths and cassimeres; lost in two years about \$30,000. William Phillips, of Phillipsburg Factory, Walkill, New York; capital, \$20,000; broadcloth. Abraham Marland, Andover, Massachusetts; capital, \$42,000; flannels altogether, to amount of 3,200 pieces in 1827, with improving sales. William W. Young, Brandywine, Delaware, commenced 1813; capital, \$100,000; blue cassimeres and coarse wool satinets; losing business since 1825. William R. Dickerson, Steubenville, Ohio, commenced 1815; capital, \$100,000; six to seven quarter broadcloths and some flannels; losses in 3 years about \$8,000. A. Schenck, Glenham Company, Matteawan, New York, incorporated 1824; capital, \$91,531; broadcloths; lost in 1826-1827, \$5,500, and in 1825-1826, \$1,795; made also machinery in last year to amount of \$30,000 or \$40,000, which was a profitable business. James Wolcott, Jr., of the Wolcott Woolen Manufactory, Southbridge, Massachusetts, incorporated seven years before; capital, \$126,000; broadcloths, principally indigo blues; stock depreciated 50 per cent.; lost in 1826, \$23,095, exclusive of interest on capital; not paying expenses. Jonas B. Brown, of Goodall Manufacturing Company, Millbury, Massachusetts; capital, \$80,460; broadcloths and satinets; latter a losing business. Joshua Clapp, Litchfield, Connecticut, also a factory at Northampton, Massachusetts; uses his factory rent free; made broadcloths; lost in 1825-1826, \$8,995; including commissions, and in 1826-1827, \$3,895. Benjamin Poor, of Saxton and Leicester factories, Worcester and Middlesex counties, Massachusetts; capital \$150,000

loss to July, 1827, \$26,394. Eleuteire Irene Dupont, near Wilmington, Delaware; capital, over \$70,000; coarse cloths and kerseys for the army, of common country wool, and of coarsest country wool linseys for negro clothing; business being always a losing one. Joshua W. Pierce, Salmon Falls Manufactory, Somersworth, New Hampshire; capital, in November, \$362,000; broadcloths only; profits in 1825, \$6,772; losses, in 1826, \$7,059.

In these factories the aggregate quantity of wool consumed was 716,559 pounds. It was stated that purchasers generally preferred English goods; they complained especially of the dyes of blue cloths, the others being as good as English. The manufacturers considered that they could make cloths as cheaply as the English, wool being of the same quality and price. More female labor and machinery were used here than in England. Four-fifths of the consumption of woollens (including that made in the household), was of American manufacture, and the whole amount was estimated at \$30,000,000 annually. Small establishments and medium capital answered better, under their sole proprietors, than incorporated companies. Manufacturing was considered favorable to morals, as the education of children was attended to in most of the large factories, particularly by Sunday Schools. The best wool, say half to full-blood merino, was preferred, but for negro cloths the coarse Smyrna and South American wools were employed. Fine and coarse wools were imported from Germany, Spain, Portugal, and England, and coarse from Smyrna, Adrianople, and Buenos Ayres. They varied much in price — Saxony cost 61 cents to \$1.60 a pound; Spanish, 35 to 85 cents; Merino, 30 cents to \$1.25; Italian, 32½ cents; German coarse wool, 16 to 20 cents; Russian, 13; Smyrna, 16 to 22; spring wool, 30 to 41; pulled wool, 30 to 35; common domestic (native), 20 to 25 cents. It was 50 to 75 per cent. higher than in England. Wool, costing 20 to 75 cents, was about half the price of the plain cloth. There was no wool more suitable for blankets than native wool, but its price had always been too high.

The woolen goods made by these manufacturers consisted of broadcloths, plain cassimeres, kerseys, kerseymeres, flannels, satinets, and negro cloths, or "linsey" — the latter a coarse fabric (made from Smyrna, Buenos Ayres, Adrianople, and the coarse grades of native domestic wool, costing from six to fourteen cents a pound in Boston), and made three-quarters of a yard wide.

Kerseymeres were a narrow cloth, 31 inches wide, containing from 14 to 16 ounces of washed wool per yard.

Broadcloths were woven from $2\frac{1}{4}$ or $2\frac{1}{2}$ yards wide, and shrank in finishing to $1\frac{1}{2}$ or $1\frac{3}{4}$ yards in width. These cloths sold all the way from \$2.50 to \$10 per yard, according to quality, and were made in black, blue, and a few fancy colors. The prices of the plain cassimeres were generally about one-half those of broadcloths made of the same qualities and descriptions of wool. The blue cassimeres sold for \$1.50 a yard in 1825, \$1.30 in 1826, and \$1.25 in 1827. The coarse cloths or kerseys, called army cloth, were finished $1\frac{1}{2}$ yards wide.

The flannels were usually sold by the piece of 46 yards, a yard wide, the prices running from \$10.50 to \$13 per piece. The satinets sold for 80 cents to \$1 a yard.

The details furnished relating to the machinery of the mills were meagre, but sufficient to indicate how primitive this machinery continued to be. Several proprietors had adopted the Brewster spinning machine, some of them preferring it for spinning warp yarns, and the jenny for filling yarns, and others complaining of the difficulty of keeping it in order. There were other improved machines spoken of, the introduction of which had considerably reduced the labor cost of manufacture, notably the "dressing machine," and the broad-power loom, both American inventions. The quality, style, and finish of goods had greatly improved within a comparatively brief period.

The data given regarding wages are valuable, because they enable a fairly accurate estimate of the great advance that has since occurred. Female weavers in the State of New York were paid from \$2.50 to \$3 a week, running one and often

two power-looms, each loom producing about 75 yards of kerseymeres per week. The other wages paid in the mill were as follows :

Boss carder (per year)	\$400.00
Machinist (per working day).....	1.50
Superintendent weaver (per working day)	1.38
1 wool sorter (per month)	30.00
1 assistant wool sorter (per month)	20.00
1 puller (per working day)	1.25
1 presser (per working day)	1.25
2 finishers (per working day)	1.25
1 dyer (per working day)	1.25
2 assistant carders (per working day).....	1.00
1 assistant dyer (per working day).....	1.00
1 watchman (per working day).....	1.00
3 laborers (per working day).....	.80
24 female spinners and weavers (per week)	3.00 —
30 female spinners and weavers (per week).....	2.50 —
Boys and girls (per week).....	from \$1.00 to 2.00

These wages were for eleven hours' work. Pay was made half in cash and the remainder in the form of due bills on the factory store, current also at the neighborhood stores, which bills were redeemable at the factory in cloth. This method of paying help was very common in all parts of the country at this period, and the factory store was the usual accompaniment of the factory itself.

1830-1840.

We come now to a period in the history of the industry of wool manufacturing in which its vicissitudes and difficulties were lessened, its methods improved, and its establishment on a successful business basis fairly completed. The decade from 1830 to 1840 showed few of those violent fluctuations which marked its predecessor, and the progress of the industry, particularly in the first half of the decade, was quite rapid, although confined exclusively to the simpler and more common products. Many causes contributed to this development. The country grew rapidly, constantly increasing the market for goods. Many notable advances in the machinery for wool-working

marked the decade, and not the least important among them were of American invention. Conspicuous among them were John Goulding's patent, which marked almost as great an advance in wool manufacture as the spinning jenny itself. Before this invention the length of the rolls issuing from the carding machines was limited to the breadth of the card, and the ends of the rolls were spliced together by hand, with the aid of the billy. Goulding dispensed with the billy altogether, accomplishing with four machines what had formerly required five, supplying the endless roll, or roping, and enabling manufacturers to produce yarn from wool at much less cost, of better quality, and in greater quantities than by the old process.

The Goulding carding machine was first introduced about 1824, and at the commencement of the next decade no new sets of cards were started on the old plan of manufacturing. The improvement not only threw out all the intermediate laborers (generally children from eight to twelve years of age), but it enabled the spinner to manage an increased number of spindles. The highest number operated by one man had been 120, which was now frequently increased to 200. The old carding engines had generally a width of 24 to 26 inches, a very few being 28 inches wide. The 40-inch cards began to make their appearance about this time, and the number of revolutions of the cylinder was increased from about 75 per minute to 85 and 100.

The year 1830 witnessed the incorporation of the Middlesex Manufacturing Company at Lowell, with a capital of \$100,000, soon increased to \$750,000, the largest establishment for the manufacture of wool that had yet been started in the United States, and one of the most successful applications, in this industry, of the corporate method of conducting manufacturing.

Another stimulus to the industry was the tariff act of 1832, which again released the coarse wools, costing eight cents a pound and under, from all duty; and they continued to be free, or practically so, until the tariff of 1861. The effect of

this legislation was to stimulate the manufacture of low-grade blankets, goods for negro wear, heavy kerseys for overcoatings, and other goods into which coarse wools entered, and the manufacture of which had been seriously disturbed by the tariff of 1828.

The duties on goods imposed by this tariff were as follows: On blankets, 25 per cent.; on Brussels, Turkey, and Wilton carpets, sixty-three cents per square yard; on Venetian and ingrain carpets, thirty-five cents per square yard; all other carpets, 25 per cent.; on flannels, bockings, and baizes, sixteen cents per square yard; on wool hats or mixtures of wool, 35 per cent.; on woolen and worsted hosiery and knit goods, 25 per cent.; on shawls, merino, 50 per cent., worsted, 10 per cent.; on woolen yarns, four cents a pound, and 50 per cent.; on worsted yarns, 50 per cent.; on worsted stuff goods, 10 per cent.; and on all manufactures of wool not otherwise provided for, 50 per cent.

The tariff changes of the decade were, however, so frequent, under the operation of the compromise tariff of March 2, 1833, as to deprive the statistician of any safe basis upon which to found a judgment as to their general influence upon the progress of the industry. The value of the imports of woolen goods rose quite steadily during the decade until the crash of 1837, when they fell off from \$24,637,881 in 1836 (by far the largest value of woolen goods imported in any single year up to this time, and for many years afterward) to \$10,808,485 in 1837. The average value of the imports for the decade was \$13,950,772, as against an average value for the previous decade of \$8,290,062. This average value was 67.40 per cent. of the reported value of the domestic product for 1840.

THE BENTON AND BARRY REPORT.

The most complete picture of the wool manufacture as it existed in this decade is supplied by a pamphlet compiled by C. Benton and S. F. Barry, and published in 1837, in which, after giving a statistical view of the number of sheep in the United States in 1836, they added "An Account of the prin-

cipal woolen manufactories in said States." They reported the existence of 1,549 sets of machinery located in fourteen States, which they classified according to the product upon which they were engaged, as indicated in the following table :

NUMBER OF SETS OF MACHINERY AND DESCRIPTION OF
GOODS MANUFACTURED IN 1836.

STATES.	Establishments.	Sets on broad-cloths.	Sets on cassimeres.	Sets on satinets.	Sets on flannels.	Sets on linseys.	Sets on blankets, hats, and yarn.	Sets on carpets.	Total sets of cards.
Total United States	411	211	111	365	99	93	24	47	950
Total Northeastern States .	411	211	111	365	99	93	24	47	950
Maine	12	3	15	5	..	..	1	..	24
New Hampshire	31	..	10	19	10	..	4	..	43
Vermont	34	37	23	37	3	..	..	..	100
Massachusetts	187	150	59	195	77	18	10	10	519
Rhode Island	41	4	..	16	..	60	..	..	80
Connecticut	106	17	4	93	9	15	9	37	184
Total Middle States	..	124	64	189	59	79	..	14	529
New York	234	100	60	100	40	51	..	..	351
Pennsylvania	45	18	1	58	19	21	..	6	123
New Jersey	..	..	..	20	..	..	..	..	20
Delaware	..	3	..	7	..	2	..	8	20
Maryland	..	3	3	4	..	5	..	..	15
Total Southern States . . .	..	9	3	20	..	38	..	..	70
Ohio	..	6	3	5	..	16	..	..	30
Kentucky	..	..	..	..	..	..	..	..	..
Tennessee	..	3	..	15	..	22	..	..	40

The majority of these mills were one and two set mills, but there were several of large capacity. In Vermont were the Ascutney Manufacturing Company, at Perkinsville, operating nine sets on cassimeres and broadcloths, and G. Catlin & Co., at Burlington, operating 16 sets on broadcloths. In Massachusetts were the Amesbury Company, 12 sets on flannels; the Salisbury Company, 23 sets, also on flannels; the Middlesex Company, at Lowell, with 27 sets; the Neponset Company, at Canton, 15 sets on cassimeres and satinets; the New England Worsted Company, at Framingham, 10 sets on yarns;

and W. & D. D. Farnum's mill, at Waterford, 10 sets on broadcloth. One-third of all the machinery reported was in this State. In Rhode Island the largest single mill was that of T. R. Hazard, at Newport, operating six sets on negro cloths. The carpet mill at Thompsonville, with 12 sets, was the only large establishment in Connecticut. In Pennsylvania there was but one large mill reported, that of J. Brankroft & Sons, at Providence, operating 16 sets on flannels. Messrs. Benton and Barry estimated that of these 1,549 sets of machinery, 150 were engaged exclusively in the manufacture of coarse foreign wool, at the average rate of 50,000 pounds per set per annum. They calculated the average consumption of the 1,400 sets engaged upon domestic and fine imported wool at 22,000 pounds per set per annum. They thus accounted for 7,000,000 pounds of coarse foreign wool, and nearly 31,000,000 pounds of domestic and fine imported wool, in the factories, and they placed the consumption of the household manufacture at 12,500,000 pounds, or a total consumption of 50,500,000 pounds of wool in the grease.¹ By these figures they sought to confirm their estimate of the wool clip of 1836, which they placed at 41,917,321 pounds, which was an average of $3\frac{1}{4}$ pounds per sheep, from 12,897,638 sheep. They calculated the value of this wool at \$21,168,246, which was an average price of $50\frac{1}{2}$ cents a pound. One of the compilers was an extensive purchaser of wool for New England manufacturing establishments, and he supplied an interesting table of the average prices he paid for wool in the States of Maine, New Hampshire, Vermont, and New York, then the chief sources of New England supply, from 1827 to 1836, as follows:

1827	36	1832	41
1828	44	1833	52 $\frac{1}{2}$
1829	29	1834	50
1830	40 $\frac{1}{2}$	1835	57
1831	58	1836	58

¹ The committee of the "Friends of Domestic Industry," who met in New York in 1831, reported that the proportion between the amount of wool worked up in factories to that in families was as three to two; and that the value of the entire annual product of wool and its manufactures in the United States was \$40,000,000.

The wool imports for the year ending September 30, 1836, as shown by a report made to Congress by the Secretary of the Treasury, were as follows:

IMPORTS.		
	Pounds.	Value.
Total.....	12,687,621	\$1,270,126
Free of duty, costing less than 8 cents per pound	11,033,010	\$806,370
Paying duty.....	1 654,611	463,756
EXPORTS.		
	Pounds.	Value.
Total	391,372	\$66,189
Free of duty	127,439	\$20,875
Paying duty.....	263,933	45,314
EXCESS OF IMPORTS.		
	Pounds.	
Coarse wool.....	10,905,571	
Fine	1,390,678	
Total	12,296,249	

The Benton and Barry statistics are excessive when measured by the contemporary statistics of the census. Thus the census of 1840 returned 19,311,374 sheep, and a clip of 35,802,114 pounds, which was equivalent to 1.84 pounds per head of sheep. This estimate of the average weight of fleece at that time is accepted by the Department of Agriculture, and it is not until 1870 that an average weight of fleece equal to that given by Benton and Barry in 1836 was reached. Moreover, they give a value to the wool alone, grown in 1836, greater than the value of all the manufactures of wool reported by the census of 1840. Still again, in order to reach a consumption of wool approaching their estimate of the clip, they were obliged to reckon every set of machinery as consuming its full capacity throughout the year. This is the obvious criticism upon their figures; and with this fact in view, we need not hesitate to materially reduce their estimates, both of the clip and the consumption.

These investigators reached the conclusion that there was barely wool enough grown in the country at that time to meet the regular demand. "The machinery in operation," they

added, "is gradually but constantly on the increase;" and it is evident from the whole context that they made their canvass at a time when the wool manufacturers were fully employed and generally prosperous.

In the midst of this progress came the great financial crash of 1837, from which the wool manufacture suffered more severely, perhaps, than any other industry. The operation of the compromise tariff, by which the reduction of duty upon the manufactured goods was in many cases greater than upon the raw material (by reason of the specific duty on the latter), tended to check any recovery from the depression that followed, and the census of 1840 was accordingly taken at a time when the condition of the manufacture was much less favorable than it had been five years earlier.

This census showed the existence of 1,420 woolen factories and 2,585 fulling mills. Invested in the former was capital to the amount of \$15,765,124; the number of hands employed was 21,342, and the value of the product reported \$20,696,999. Of this amount \$16,765,562, or 81 per cent., was returned from the five States of Vermont, Massachusetts, Connecticut, Pennsylvania, and New York. These figures have only to be compared with those given by Mr. Bishop, as for the decade ending 1830, to establish the extravagant nature of the latter. The average product of the 1,420 mills reported would be only \$14,575, a fact sufficient to show that the great majority of these mills were the little neighborhood carding establishments which were not properly included as woolen factories. If we may judge from these statistics, the proportion of the imported goods consumed during this decade was larger, in its ratio to the factory product, than at any period subsequent to 1800.

1840-1850.

The decade between 1840 and 1850 witnessed rapid growth in the domestic wool manufacture. The value of the product, as reported by the census of 1850, increased from \$20,696,999 to \$49,636,881, or 140 per cent. The actual increase was not as great as these figures indicate, owing to the fact, before

alluded to, that the census of 1840 underestimated the value of the product of woolen mills in that year. Nevertheless the figures are conclusive that the decade witnessed a much wider development than the industry had attained at any previous period. The value of the products of the cotton mills increased during the same decade from \$46,000,000 to \$62,000,000. It appears, therefore, that the wool manufacture, while still far behind the cotton industry in the value of its product, was growing in a greater ratio.

The census of 1850 reported 1,760 establishments engaged in wool manufacture, located in thirty-two States, using a capital of \$32,516,366, and employing 47,763 operatives, — an increase of 26,421 over the number of employees reported in 1840. This number included 630 carding mills, employing 1,093 operatives, and manufacturing products valued at \$1,739,476.

For the first time figures were given of the amount of wool consumed in the domestic manufacture, which was given as 70,862,829 pounds, including both foreign and domestic. The census return of the domestic clip for that year was 52,516,959, and the imports were 18,695,294; total, 71,212,253 pounds. There is remarkable agreement between these figures of supply and consumption. The increase in the domestic clip had not kept pace with the increased requirements of the manufacturers, and the percentage of imports of wool to the total supply rose from 21 in 1840 to 26 in 1850.

Neither had the domestic manufacture gained perceptibly in the proportion of the home market held by it. The imports of woolen goods of all kinds rose in value from \$10,808,485 in 1840 to \$19,620,619 in 1850, a rate of increase somewhat less than that shown by the census in the domestic manufacture.

The wool manufacture in 1850 held the fifth rank among our domestic industries in the value of its products, being surpassed by boots and shoes, flour and grist mills, lumber mills (sawing and planing), and by the cotton manufacture. The only analysis of the products of woolen mills made in 1850

showed 82,206,652 running yards of cloth manufactured, and 4,294,336 pounds of yarn for sale, "besides blankets and hats."

Two changes in the tariff on woolens marked this decade. The act of 1842 imposed on woolen goods a duty of 40 per cent., which was an increase from 29 per cent. (the rate then in force under the operation of the compromise-tariff of 1833). The duty on wool was fixed at 3 cents a pound and 30 per cent. ad valorem, a decrease from 4 cents a pound and 26 per cent. ad valorem, as the compromise-tariff rates then stood. But wool valued under 7 cents, which was free under the act of 1833, was made dutiable at 5 per cent. On the whole the readjustment of the tariff was of advantage to the manufacturer. These rates of duty were in force for four years only. But during that brief period the domestic manufacture of the finer qualities of broadcloth made great progress.

The influence of a wool duty on the manufacture of wool was strikingly illustrated in this particular branch of the manufacture under the subsequent tariff, that of July 30, 1846. That law reduced the duty on woolen goods in general from 40 to 30 per cent., on flannels and worsteds to 25 per cent., and on blankets to 20 per cent. The duty on wool of all grades and descriptions was placed at 30 per cent., the identical duty upon the higher forms of wool manufacture, so that the one duty largely offset the other. The ultimate effect of this anomaly of the law was thus described in the report of the United States Revenue Commission for 1866 :

Under the tariff of 1842 no less than 1,800 looms were in operation in the manufacture of broadcloths. Under the tariff of 1846, which put the same or a higher duty on wool, as on woolen goods, the manufacturers found it in vain to struggle against foreign rivals. The higher branches of the manufacture were abandoned ; soon every one of the 1,800 broadcloth looms in the country ceased work. The only branches of the manufacture which continued with activity were those like flannels, which were supplied by the common wool of the country, so superior in its spinning qualities as in itself to afford an advantage over the foreign manufacture. There was no longer a demand for any but the common wools.

The Saxon wool husbandry ceased with the manufacture of fine cloth which had called it into existence.¹

The cloths manufactured continued to be confined to satinets, jeans, cassimeres, doeskins, beavers, flannels, and blankets. Near the close of the decade, Scotch plaids, in many beautiful colorings, were manufactured, and shawls were successfully made in considerable abundance. It has been stated that in 1843 the Middlesex Company made the first three-quarter fancy trouserings, which sold readily at \$2 per yard; and it was during this decade that Edward Harris introduced his famous double and twist cassimeres. American shawls and blankets from the Bay State mills were awarded prizes at the International Exhibition of 1851. There were also many mills making tweeds, and the fancy cassimere was already in vogue. The decade was notable also as witnessing the first attempt at the manufacture of worsted stuffs in this country.

IMPROVEMENTS IN WOOLEN MACHINERY.

The decade was also important and interesting in the progress it witnessed in the improvement of machinery for wool manufacture. It was during this period that the Crompton fancy power loom was generally introduced. Mr. Crompton had obtained a patent for his invention in 1837, but the depressed condition of manufacturing delayed its use for a number of years. As Mr. Samuel Lawrence has written, "Not a yard of fancy woolens had ever been woven by power loom in any country until it was done by Mr. Crompton at the Middlesex mills in 1840." Within three years all the looms in the mill, 150 in number, had been altered, and the whole weaving power was turned upon fancy cassimeres. These original looms were 26½ or 27 inches wide, and the cloth was shrunk by fulling to 20½ inches. The popularity of these cloths were such that they successfully competed with the celebrated goods of the Messrs. Bonjean, Sedan, France, who

¹ Report of United States Revenue Commission, 1866, page 428.

had largely supplied the American market with a similar fabric made upon the hand loom.

Not less important were the inventions of Erastus B. Bigelow, from which began the manufacture of carpets by the power loom. The essential features of this great invention were contained in Mr. Bigelow's loom for weaving coach lace, patented in 1837; but it was not until 1843 that the loom was successfully applied to the weaving of ingrain carpets in the mills of the Lowell Manufacturing Company.

These inventions greatly reduced the cost of carpets, and thus largely stimulated their use. The foreign carpet manufacturers, who still employed the hand loom, lost a large part of the American market hitherto theirs, as is plainly shown by the statistics of carpet importations in the earlier years of this decade.

In 1848 Mr. Bigelow perfected his Brussels power loom, and the Bigelow Carpet Company, which he organized the year following, at once started 30 machines, each of which produced, with the aid of one weaver, 20 to 25 yards a day, from three to four yards daily having been the average product of a hand loom.

The most comprehensive view of the domestic manufacture as it existed at the middle of this decade is again obtained from a private source in the shape of a little volume entitled "Statistics of the Woolen Manufactories in the United States," published in New York in 1845. We have not been able to ascertain the name of the author of this publication, which may be called the pioneer of the present textile directories, but he was engaged in the sale of the condensing cards, and he states that in the collection of his data he visited, either in person or by attorney, every considerable wool manufacturing establishment then in existence. He presented a directory giving the name, the location, the machinery capacity, and the character of the products of 1,044 establishments, exclusive of carding mills, operating 1,813 sets of cards; and from this directory we have condensed the following bird's-eye view of the condition of the industry in 1845:

TABLE SHOWING NUMBER OF WOOLEN MILLS (EXCLUSIVE OF CARDING MILLS) IN THE UNITED STATES IN 1845, BY STATES, THE NUMBER OF SETS OF CARDS, AND DESCRIPTION OF GOODS MANUFACTURED.

STATES.	Total number of establishments (exclusive of carding mills).	Total number of sets of cards.	KINDS OF GOODS MADE, NUMBER OF ESTABLISHMENTS, AND NUMBER OF SETS OF CARDS OF EACH CLASS.											
			Broadcloths and kerseymeres.		Kerseymeres, flannels, satinet, and tweeds.		Jeans and negro cloths.		Carpets.		Hosiery.		Yarns.	
			Number of establishments.	Number of sets of cards.	Estab-lish-ments.	Sets.	Estab-lish-ments.	Sets.	Estab-lish-ments.	Sets.	Estab-lish-ments.	Sets.	Estab-lish-ments.	Sets.
The United States	1,044	1,813	102	367	767	1,119	115	170	36	104	4	9	20	44
Total New England States .	463	1,018	54	235	346	628	44	78	11	53	2	2	6	22
Maine	28	44	5	12	22	31	..	..	..	1	1	..	..	..
New Hampshire	58	81	1	7	54	70	..	..	..	..	..	..	3	4
Vermont	76	113	11	36	65	77	..	..	..	..	..	..	..	..
Massachusetts	141	483	28	165	105	284	3	3	3	14	..	..	2	17
Rhode Island	40	79	..	..	1	6	39	73	..	..	..	..	..	..
Connecticut	120	218	9	15	99	160	2	2	7	38	2	2	1	1
Total Middle States	457	644	46	127	371	437	2	5	23	48	2	7	13	20
New York	326	439	30	91	280	316	..	..	13	25	1	5	2	2
New Jersey	10	19	2	5	6	9	..	..	..	..	..	..	2	5
Pennsylvania	101	147	12	21	72	93	..	..	8	19	1	2	8	12
Delaware	4	12	2	10	1	1	..	..	..	..	..	..	1	1
Maryland	16	27	..	..	12	18	2	5	2	4	..	..	..	..
Total Southern States	27	36	1	3	8	11	17	20	..	..	..	..	1	2
Virginia	18	24	1	3	7	10	9	9	..	..	..	..	1	2
Kentucky	9	12	..	..	1	1	8	11	..	..	..	..	..	..
Total Western States	97	115	1	2	42	43	52	67	2	3	..	..	..	..
Ohio	79	97	1	1	26	27	50	65	2	3	..	..	..	..
Indiana	6	6	..	..	5	5	1	1	..	..	..	..	..	..
Illinois	6	6	..	..	5	5	1	1	..	..	..	..	..	..
Michigan	6	6	..	..	6	6	..	..	..	..	..	..	..	..

Another differentiation of this information is valuable as indicating the relative capacity of these mills. The table below groups the mills existing in 1845 according to the number of sets of machinery they contained :

NUMBER AND CAPACITY OF WOOLEN MILLS IN UNITED STATES IN 1845.

STATES.	1-set mills.	2-set mills.	3-set mills.	4-set mills.	Over 4-set mills.	Total woollen mills.	Carding mills	Grand total.
Total	742	151	66	32	53	1,044	132	1,176
New England States	266	93	45	19	40	463	35	498
Middle States	369	46	19	11	12	457	51	508
Southern States	21	4	1	1	1	27	20	47
Western States	86	8	1	1	1	97	26	123
Total New England States . .	266	93	45	19	40	463	35	498
Maine	20	3	3	1	1	28	5	33
New Hampshire	42	13	2	1	1	58	7	65
Vermont	57	11	4	1	3	76	8	84
Massachusetts	49	33	21	13	25	141	10	151
Rhode Island	20	13	4	1	3	40	5	40
Connecticut	78	20	11	4	7	120	5	125
Total Middle States	369	46	19	11	12	457	51	508
New York	274	27	11	6	8	326	21	347
New Jersey	6	1	1	2	1	10	5	15
Pennsylvania	78	13	6	2	2	101	14	151
Delaware	2	1	1	1	1	4	2	6
Maryland	9	5	1	1	1	16	9	25
Total Southern States	21	4	1	1	1	27	20	47
Virginia	15	1	1	1	1	18	11	29
North Carolina	1	1	1	1	1	3	3	3
South Carolina	1	1	1	1	1	1	1	1
Georgia	1	1	1	1	1	3	3	3
Kentucky	6	3	1	1	1	9	9	9
Tennessee	1	1	1	1	1	2	2	2
Total Western States	86	8	1	1	1	97	26	123
Ohio	68	8	1	1	1	79	11	90
Indiana	6	1	1	1	1	6	6	6
Illinois	6	1	1	1	1	6	3	9
Michigan	6	1	1	1	1	6	6	6
Wisconsin	1	1	1	1	1	7	7	7
Iowa	1	1	1	1	1	2	2	2
Missouri	1	1	1	1	1	3	3	3

There were but 53 mills containing over four sets of cards, 40 of which were located in the New England States, and the remainder, except one in Ohio, in the middle states, chiefly in

New York and Pennsylvania. The largest mill was still the Middlesex, which had grown from 27 sets in 1836 to 36 sets, and was now employing 1,500 operatives, and manufacturing 119,000 yards of broadcloths and 624,000 yards of kerseymeres per annum. The mill was then under the management of Samuel Lawrence, and owned by Lawrence, Stone, & Lawrence, of Boston. "It is truly delightful," wrote the compiler, "to witness with what wonderful regularity every department of this extensive establishment is conducted, each managed with a celerity, dispatch, and regularity that can not be surpassed in this or any other country." He is equally enthusiastic in speaking of the Farnum mill at Waterford, Worcester county, the second largest cloth mill in the United States, employing 350 male and 150 female operatives, to whom \$70,000 was paid in wages, running 25 sets in three mills, and using 1,100,000 pounds of the finest American wool, which was converted into 62,400 yards of broadcloth, 468,000 yards of fancy kerseymeres, and 104,000 yards of plain kerseymeres. The Farnums were among the first to enter upon the manufacture of fancy goods.

A third typical establishment of the era was the New England Worsted Company, at Saxonville, running 16 sets of cards and 20 combing machines, and manufacturing 350,000 pounds of worsted yarns, 800,000 pounds of woollen yarns, 30,000 pieces of bunting, and large quantities of blankets, flannels, and negro cloths.

Writing of the Hartford Carpet Company, at Thompsonville, Connecticut, chartered in 1828, the compiler states that it was then consuming 1,000,000 pounds of wool, manufacturing Axminster, Wilton, Brussels, three-ply, super ingrain, damask, and Venetian carpets, and rugs of every description, to the extent of upward of 1,600 yards daily, and "the colors are equally durable with those of foreign importation." A still larger mill at Tariffville, in the same State, and operated by the same company, was consuming 1,200,000 pounds of wool and paying \$150,000 a year to 1,000 operatives.

These mills were hardly typical of the period, for they

were famous as the extreme development of the industry; and it is interesting to note that the largest mills of that time were less than one-half the capacity of many of the present-day establishments. "It is apparent," says the compiler in his preface, "that the woolen manufacture of the United States is more indebted to the patriotic enterprise and indomitable perseverance of individuals, whom primary difficulties and even reverses could not discourage, rather than to any special legislation or popular countenance and appreciation. It has passed through all the vicissitudes of prosperity and adversity, now suddenly elevated, then as suddenly depressed, to-day courting investment and anon deserted by capital, until ultimately it has conquered its vantage ground and established itself upon a munificent basis for the inheritance of prosperity."

That the wool manufacture was exceptionally prosperous about the time of the publication of this volume and later, we have abundant evidence. In his volume on "Sheep Husbandry in the South," Hon. Henry S. Randall publishes a letter from S. Newton Dexter, of Whitestown, the managing director of the Oriskany Manufacturing Company, "a gentleman equally distinguished for his correct and able business character and for the capacity and range of his information on all topics connected with the wool manufacture," under date of April 24, 1847, from which we make these extracts:

I am inclined to think that you overestimate the profit of manufacturing woolen goods, although I admit that in well-managed institutions that have the most improved machinery, with an abundant capital, the profits have at times been very large indeed, and our friend, Samuel Lawrence, of whom you speak, is the most prominent example of such a manufacturer within my knowledge.

. . . Every new manufactory erected, if built with judgment, has one advantage over those already in operation, and that is, it has availed itself of all the improvements of those in operation, and as machinery is constantly being produced at cheaper rates, a factory of increased capacity will probably cost less money.

. . . The Oriskany Manufacturing Company is the oldest com-

pany now manufacturing woolen goods in the United States. It has made satinets which have sold readily at \$3 per yard, and cloths which have as readily sold for \$12 per yard. Satinets fully as good can now be bought at 75 cents, and handsomer if not better cloths for \$3. And yet the Oriskany Manufacturing Company was perhaps never doing better than now. This company availed itself of the opportunities offered last year to obtain wool very low to purchase a supply for nearly two years. This year the business will be good — that is, pay a profit of 10 per cent. on investments; but I do not believe it will pay more. I will furnish you with a brief estimate:

A mill with a capital of \$100,000 will manufacture, say, 90,000 yards of 6.4 cloth, which will bring in market an average of \$1.50 per yard, or	\$135,000
To get these cloths into cash (for they are sold at 8 months, and are charged with commission of 5 per cent.), and other charges, equal in all, interest, boxing, and transportation, to 12 per cent.	\$16,200
Cost of 225,000 pounds of wool at 30 cents	67,500
Cost of 3,300 gallons sperm and lard oil at \$1, ...	3,300
Cost of soap, soft and hard	3,500
Cost of 800,000 teasels	1,000
Cost of dyeing materials of all kinds	11,500
Cost of fuel	1,000
Cost of paper, tape, twine, nails, lumber, cards, candles, etc.	3,000
Cost of labor, \$5.000 per quarter, or	20,000
Insurance	2,000
	\$129,000

You may think \$1.50 a low average for cloths, but it must be a very fair cloth to bring that sum, I assure you. You may also think 12 per cent. a high charge for getting these cloths into cash, etc., but it is scarcely what we pay; and the records of our wool book will show that 30 cents is the cost of such wool as we work. And our books will prove that it has taken, for many years past, $2\frac{1}{2}$ pounds of wool to make a yard of broadcloth. There is 6 per cent. left for profits here, because I have not allowed one cent for

repairs or taxes or for agents' salaries, which will swell the expenses fully up to \$131,000, within a fraction of swallowing up all over 4 per cent.

1850-1860.

The census of 1860 proves that the progress of the wool manufacture in the previous ten years had not been as rapid in proportion to the growth of the country as in the decade ending in 1850. This is the more noteworthy because it was a decade marked by extraordinary advances, not only in the material and industrial development of the country, but in all the mechanical appliances of the manufacture. Wider cards were now generally in use, and looms were wider and much simplified. In the finishing department the fulling mills, gigs, shears, and presses were all greatly improved, the effect being to increase product, improve quality, and reduce the cost of manufacture.

The tariff of 1846, in force during the greater part of the decade, was, as we have seen, not favorable to the promotion of the industry. It imposed the same rate of duty, 30 per cent., upon wool and manufactures of wool, except upon worsteds, which were dutiable at 25 per cent., and blankets, which were dutiable at 20 per cent., the effect of which was to deprive the manufacture of advantage from the duty upon goods which involved the use of foreign wool. We have seen how this tariff affected the manufacture of fine broadcloths. It prevented any advance in the worsted manufacture, and necessarily confined the industry to such goods as could be made to advantage from the domestic wools, of which the supply continued to be inadequate.

The records of the year 1850 may be taken as a measure of this inadequacy. The domestic clip of that year was given by the census at 52,516,959 pounds, an increase of but 6,714,855 pounds in ten years. The imports for the same year were 18,695,294 pounds, or 26.25 per cent. of the total supply of the manufacture. In the subsequent year they rose to the unprecedented total of 32,607,315 pounds, and they averaged for the decade 24,583,639 pounds per annum. Of the

18,695,294 pounds of outside supply thus received, in 1850, 11,770,607 pounds were from South America, and of these the bulk were the mestizo wools of the Argentine Republic. The remainder of the wool imports were chiefly the low Turkey wools which were employed in the carpet manufacture.

The mestizo wools were enough cheaper than the domestic wools to permit their employment to advantage in admixture with the latter, and even after payment of the duty to effect a reduction in the cost of manufacture; but they were accessible to foreign manufacturers at a price correspondingly less, and the advantage thus secured was reflected in the statistics of imported manufactures. The entered value of these imports in 1850 was \$19,392,871, and they rose rapidly in quantity throughout the decade, reaching a total value of \$37,904,473 in 1854, and having an average value for the ten years of \$31,333,273, as against an average value in the previous ten years of \$13,005,852.

In 1860 the importations rose to \$43,141,988 in value, which was 34.83 per cent. of the total supply of goods as determined by the census of domestic manufacture and the statistics of imports.

Mr. George William Bond, who was personally interested in the manufacture at this time, epitomized the condition of the industry in the decade as follows: "Under the impulse of the tariff of August 30, 1842, manufacturing slowly revived for a time (after the prostration of 1837), but woollen manufacturing was as a whole unprofitable until after the passage of the act of 1857."

The act of 1857 effected a radical change in the economic status of the industry. While it reduced the duty on woollen goods from 30 to 24 per cent. it partially compensated the manufacturers for this reduction by admitting, free of all duty, wools valued at not over 20 cents a pound, and fixing the duty on all other wools at 24 per cent. ad valorem. It was still an inequitable adjustment as to the higher-priced wools, but as the mestizo and Cape wools, by reason of their

cheapness, were exempted from all taxes at the custom-house, the manufacturers generally accepted the status thus established as an improvement over any which the law had fixed under any prior tariff since that of 1816. The immediate effect of this tariff, putting cheap grades of wool on the free list, wrote Mr. Bond, was "a sudden and rapid rise in the value of all wools in the markets of production to a point far beyond the duty, and in most cases beyond their value in the consuming markets of Europe." This result was unexpected; the consequences which might otherwise have naturally been visible in the industry were swallowed up in another event.

The law of 1857 had hardly become dry on the statute books before the industry, in common with all others, was overwhelmed in the financial crisis of 1857. The disaster brought by this crisis was particularly severe upon the wool manufacture. The bankruptcy of many of the largest corporations ensued, causing the downfall of a number of the leading commission houses and the collapse of smaller woolen mills located in all parts of the country. For a time wool prices were merely nominal, and many descriptions were unsalable at any price. The recovery was gradual, but when once under way it was followed by an activity in manufacturing which equaled that following the tariff of 1842. The census of 1860 would have shown greater advances had it not been so immediately preceded by the crisis of 1857, from the demoralization of which the industry did not fully revive until after the stimulus of the war of 1861-1865 began to be felt.

Nevertheless, the returns of wool manufactures showed an increase of 62.65 per cent in ten years. The value of woolen and mixed goods made in 1850 was \$49,636,881. In 1860 it amounted to \$80,734,606. The establishments numbered 1,673, of which 467 were in New England, 793 in the middle, 333 in the western, two in the Pacific, and 78 in the southern states. The aggregate capital invested in the business was \$42,849,932, and it employed 32,632 male and 26,890 female

hands, 639,700 spindles, and 16,075 looms, which worked up 98,379,785 pounds of wool, the value of which, with other raw materials, was \$46,649,365. The foregoing figures include satinets, Kentucky jeans, and other fabrics of which the warp was cotton. In the manufacture of these mixed goods the amount of cotton consumed was 21,140,403 pounds.

The largest amount of woolens was made in New England, where the capital employed was \$26,235,053, and the value of the product \$50,097,056, a little more than the total value reported for the United States in 1850. More than half the capital and one-half of the product of New England belonged to Massachusetts, which had 162 factories of large size. Connecticut ranked next. The value of woolens produced in the middle states was \$25,234,314, in the western \$3,172,912, and in the Pacific and southern states \$2,230,324. Pennsylvania, next to Massachusetts, was the largest producer, having 510 factories, which made \$13,016,082 worth of woolen and mixed fabrics, an increase of 145 per cent. The product of 222 establishments in the city of Philadelphia had a value of \$8,919,019.

The State of New York held the third rank in relation to this industry, its manufactures amounting to more than \$9,000,000. The woolen manufactures of Maryland showed an increase of 117 per cent. In Ohio, which produced in 1850 a greater value of woolens than all the other western states, there was a decrease from the product of 1850. In Kentucky, which was then, next to Ohio, the largest manufacturer of wool west of Pennsylvania, the product was \$856,926 and the increase in ten years 169 per cent.; while in Indiana, which ranked next, it was 216 per cent., and in Missouri 182 per cent.

This census accorded the eighth rank to the wool manufacture among the great industries of the country, it being exceeded, in the value of its products, by boots and shoes, the clothing manufacture, iron, lumber, flour and meal, leather and skins, and cotton manufactures, the value of the products of the latter being given as \$115,681,774.

Some interesting details of products accompanied the census of 1860. The number of yards of cloth produced was 124,897,862, in addition to 6,401,206 pounds of yarn for sale 296,874 pair of blankets, 616,400 long and square shawls, besides table covers, felted cloths, coverlets, etc. These totals included, as before and since, satinets, Kentucky jeans, and other fabrics made upon the cotton warp; and the total quantity was equivalent to nearly four yards to each person in the United States.

As the census of 1860 marks the close of the first period of the wool manufacture in the United States, before it took on the distinctive characteristics imparted by the war of 1861-1865, and which have since distinguished it, it will be well to point out some of its peculiarities at this time.

Worsted goods were made by two factories in Massachusetts and one in New Hampshire; viz., the Pacific Mills at Lawrence, the Hamilton Woolen Company at Southbridge, and the Manchester Print Works. These three mills employed a capital of \$3,230,000, consumed 3,000,000 pounds of wool and 1,653,000 of cotton, and their aggregate products were valued at \$3,701,278, and consisted of 22,750,000 yards of all wool and cotton warp goods, mousselines de laine, bareges, cashmeres, challies, reps, etc., for ladies' wear. They also made worsted carpet and hosiery yarns for sale. The census of 1860 informs us that the gray mousseline de laine manufactured by the Manchester mills at this time was made with No. 37 cotton warp and No. 40 wool filling for the coarser varieties, and the finer grades with No. 70 cotton warp, spun on the Potter mule, and No. 50 worsted weft spun on the Smith mule. These three establishments were all that were reported at the census of 1860 as engaged in the worsted manufacture, although previous reports had indicated a much larger number of worsted manufacturers. The Massachusetts census of 1845 indicated ten small establishments as then in operation in that State, employing 846 hands, and producing 2,321,338 yards of woven goods, valued at \$382,858, and 617,360 pounds of yarn, valued at \$271,708. Excel-

lent fabrics of mousseline de laine, alpaca, and Orleans cloth were made about this time by the Ballardville Company at Andover. The New England Worsted Company at Saxonville, Massachusetts, which failed in 1837, had done a considerable business previous to that date, employing the New England comb, in the very first combing done by machinery in this country.

In the woolen goods manufacture the distinctive feature of the decade was the tendency to fancy goods. Patterned woolens had been chiefly imported prior to 1850 from Sedan and Elbœuf in France, Verviers in Belgium, and the west of England. The fashion for these goods became so pronounced that many establishments now turned their whole machinery upon them, with results on the whole very satisfactory. The ten years ending with 1860 will always be remembered as the period when the styles and fabrics for men's wear were of greater variety than ever before or since. Vests were made from brilliant patterned cassimeres, velvets, brocades, and silks, but rarely of the same material as the trousers. These last were plaids, checks, stripes, and mixtures, running largely to light and medium colors, and extravagant in pattern. These tendencies of fashion were trying to manufacturers beyond the conception of the average person, and increased the risks and diminished the profits of manufacture.

1860-1870.

While the census of 1860 was still being compiled, the wool manufacture entered upon a new chapter which was to mark its advance to a rank nearly equal to that it had long since attained in England, France, and other European countries. The war of 1861 recreated the American wool manufacture. It established conditions very closely resembling those which arose in the war of 1812, and resulted at that time in a sudden and abnormal advance in the industry. The after-results, however, were widely different, complete collapse following in the one case, and an accelerating prog-

ress in the other. The need for revenue led to a large increase in duties from time to time, as the war progressed, under which the wool manufacture obtained the highest protection it had ever received. The requirements of the government for army clothing created a constant demand for certain lines of goods, which at times taxed to the utmost the resources of all the mills engaged upon them.¹

The high prices which prevailed made profits large, and fortunes were accumulated with rapidity and ease. New mills started into existence, and many whose machinery had been adapted to the manufacture of cotton were converted into woolen mills, a tendency which was further stimulated by the prolonged cotton famine.

Without entering into elaborate details regarding the remarkable development of this decade, we may add that it resulted in an enormous diversification of the industry, — what it had always before conspicuously lacked, — and in the establishment of mills for the manufacture of every line of woolen goods for which there was any demand. At the end of the decade this diversification had become one of its chief characteristics, one which it retains, and one in which it may be claimed to surpass the industry in any other country. Importations of woolen goods fell off to a point lower than the average for the previous twenty-five years. The enormous prices which the raw material commanded stimulated the farmers to an increase of their flocks. The domestic clip increased with a rapidity unprecedented in any country, not

¹ George William Bond estimated, from official reports received from the quartermaster general of the United States of the quantities of woolen goods purchased for the army in 1862 and 1863, that the quantity of wool consumed in our mills for army use was as follows, in the years named: 1862, 51,400,000 pounds; 1863, 61,300,000 pounds; 1864, 61,300,000 pounds. To this must be added the consumption of the navy, and for cartridges, and the grand total cannot vary much from 200,000,000 pounds. We may compare these conditions with the condition of the country at the commencement of the war of 1812, when the Secretary of War was compelled to ask Congress for permission to import 5,000 blankets for the supply of the Indians.

“From our own looms we furnished in one year no less than 35,000,000 garments to our soldiers and supplied cloths to the army and navy which in three years consumed 200,000,000 pounds of wool. Of the cloths thus furnished, an assistant quartermaster-general in charge of these supplies officially says: ‘It has been demonstrated that American army cloths are much stronger than those in use in the armies of Europe.’”
—Report of United States Revenue Commission, 1866.

even surpassed by the extraordinary growth of the Australasian clip in later years. The clip of 1859, reported at 60,264,000 pounds, had nearly doubled in 1862, when it was reported at 106,000,000; and it rose to 123,000,000 in 1863, 142,000,000 in 1864, and 155,000,000 in 1865. Even this increase did not meet the demand for raw material, and the imports of wool rose during the same years in even greater degree, jumping from 26,000,000 pounds in 1859 to 75,000,000 in 1863. A slight falling off occurred in the following years, and these imports of wool were not again approximated until 1870.

A remarkable change in the raw materials consumed by the industry grew out of the legislation of this period. Under tariff of 1857, by which wools costing twenty cents or less per pound were admitted free of duty, the mestizo wools of South America and the Cape of Good Hope wools were imported free of duty. Under the law made in 1864 many of the mestizo and Cape wools were admitted at three cents duty, which was but a slight barrier to their importation. The tariff of 1867 raised the duty on these wools to ten cents a pound and ten per centum ad valorem. What had thus far been a principal source of supply of raw material was thus practically excluded from the country. Up to that time these wools were the basis of our most important manufacture, that of fancy cassimeres. This had been made possible by the invention of the Crompton fancy loom, and of burring machinery, which permitted the use of Buenos Ayres wools, purchasable at extremely low prices, because of the burr they contained, which made them unsalable. The fancy cassimere manufacture may thus be said to have been developed by the use of mestizo wool, the imports of which fell from 36,760 bales in 1866 to 6,000 bales in 1868; and a practical revolution in the fancy cassimere industry was effected by the change of the material used from mestizo to domestic wool.

Another change of like character, and equally radical, occurred, through legislation, in the supply of wools adapted

to the worsted manufacture. Under the Canadian reciprocity treaty of 1854 the long combing wools of English blood, peculiar to that country and Canada, and then exclusively employed in this branch of the industry, were free of duty if grown in Canada, and were imported in large quantities. Practically none of these wools were grown in the United States at that time, and the domestic worsted manufacture, which developed rapidly in this decade, was dependent upon the Canadian clip, the free supply of which had been a great stimulus to its growth. The Canadian reciprocity treaty expired in 1866, and the wool manufacturers made an ineffectual attempt to secure the exemption of these wools from the high rates of duty imposed by the tariff act of 1867.

It is undoubtedly true that the first effects of the conditions created by the war were to deteriorate the quality of the manufacture. Goods moved rapidly, and manufacturers wasted as little time as possible in passing the material through their mills. The ready markets tempted to the use of inferior materials, as well as inferior workmanship, and adulteration was carried so far that it became a by-word. But this phase of development passed as quickly as it arose. Competition became closer as conditions grew normal, and before the close of the decade the American manufacturers had attained, both at home and abroad, a reputation they had not previously possessed, both for the style and salable character of their patterns and the finish of their goods. This fact was well attested at the Paris Exposition of 1867, where for the first time awards were made for American woolen goods. These awards, made to the Washington mills, S. Slater & Sons, H. Stursburg, and others, were accompanied by certificates commending the excellence and variety of the fabrics presented, their fitness for general consumption, and the reasonableness of the prices at which they were sold. The display of black broadcloths, doeskins, castors, blankets, beavers, and other card-wool fabrics made by these American mills, was accorded equal praise with similar lines of goods made in English and German mills.

The measure of the remarkable growth of the decade 1860-1870 is clearly defined by the comparative figures. The value of products advanced from \$80,734,606 to \$217,668,826. In making the comparison between the two periods, however, it is necessary to bear in mind the fact that the values of 1870 are currency values, and that the census was taken for a period during which the gold value of the paper dollar was 79.81 cents. The gold value of the above production was therefore \$173,721,490, an increase in the value of products between the two censuses of 115.18 per cent.

The number of operatives employed about doubled, advancing from 59,522 in 1860 to 119,859 in 1870, while the advance in wages paid was even more phenomenal, increasing from \$13,361,602 in gold to \$40,357,235 in currency.

It is probable that no record of progress equal to that which occurred in the wool manufacture in this decade can be found in any industry, in any country, in a period of similar duration.

The true measure of growth in the decade is the quantity of raw material consumed, a unit of measurement uninfluenced by the financial condition of the country. The consumption of wool in 1860 was 98,379,785 pounds, which increased in 1870 to 219,970,174 pounds, or 123.59 per cent.

The domestic clip increased during the decade from 60,000,000 to 180,000,000, and the imports of wool from 26,282,000 to 34,000,000 in 1869. Of the wool consumed in the manufacture, 46,581,105 pounds was enumerated as foreign wool, a proportion it is difficult to reconcile with the smaller figures of imports for this and previous years.

Of the causes contributing to this advancement we have already said sufficient. They were: (1) The cotton famine. (2) The demand for army clothing. (3) The war tariffs, constantly becoming higher, and excluding imports with increasing rigor. (4) The general stimulus created by high prices and the unnatural activities of a war period. That the wool manufacture advanced to a point that could not be

sustained on a peace-footing basis became evident as soon as the war closed. For several years the wool manufacture suffered the usual consequences of over-production; but they were much less serious than might have been expected, and not to be compared with those that followed the war of 1812. The country was rapidly growing up to the measure of the development this industry had attained, and the tariff of 1867, which increased the duties both on wool and woolens beyond the point of the act of 1864, prevented foreign goods from securing any proportionate increase in this increasing market.

The close of the decade found the wool manufacture thoroughly organized, for the first time, in all branches of the industry, and able to supply the greater portion of the public needs in each. The chief exceptions to this rule were in the line of fine broadcloths and of fine all-wool dress goods for ladies' wear. The goods now made included cloakings, beavers, and coatings, of carded wool, and worsted dress goods, mostly cotton warps in great variety, but including some of the "French" cashmere variety. On shawls some 25 mills were employed, completely supplying the domestic market; over 30 factories were making flannels, and supplying about four-fifths of the market; about 45 mills were making blankets, with a capacity equal to the home demand. The hosiery and knit goods branch of manufacture was substantially organized in this decade, and 248 mills were in operation in 1870. The carpet industry had attained enormous development, and consumed in 1870 more than 25,000,000 pounds of wool. In the manufacture of bal-morals, kerseys, and various mixed fabrics the increase was very great. But the worsted manufacture particularly had its heyday in this decade, the number of establishments engaged in it increasing from 3 to 102, and the value of its products from \$3,701,378 to \$22,090,331. A dozen mills were engaged upon worsted yarns for sale; half a dozen upon reps, terry, and similar goods, and the remainder chiefly upon worsted dress goods, mohairs, poplins, Italian cloths, alpacas, delaines, armures, etc.

1870-1880.

To properly understand the conditions under which the wool manufacture was carried on during this decade it is necessary to describe the legislative status which existed, without essential variation, during the entire period. This status was determined by the tariff act of 1867, which related only to wool and woollens, and was enacted with the concurrence of wool growers and wool manufacturers. Up to this time there had never been any agreement between these two industries as to the relationship that should exist between duties on the raw material and the manufactured goods. Tariff after tariff had been enacted without regard to the fact that so long as it was necessary to use imported wool, any rate of duty imposed upon this raw material reduced by that amount, or by some portion of that amount, the net protective duty upon manufactured goods, since it added the duty to the cost of domestic manufacture as compared with the cost of foreign manufacture, and thus in some measure offset the duty on the manufactured article. This unscientific adjustment has proved particularly onerous under the tariff of 1846, wherein the duty on wool and on goods was the same, and under the tariff of 1857, so far as related to high-priced wools, with the saving fact, in the latter case, that the combing wools of Canada were then free of duty under the reciprocity treaty of 1854.

These anomalies of earlier tariffs had been recognized and in a degree reconciled in the Morrill tariffs which were enacted during the war; but the act of 1867 was the first tariff which undertook to found the relationship between the two classes of duty upon a scientific formula, established by actual experience.

Out of this formula grew the system of compound duties on goods. In this compound system the specific duties on goods were adjusted so as to be equivalent, in theory at least, to the specific duties on the raw materials entering into the goods, leaving the ad valorem rate as a protective duty for the manufacturer. The basis of the compensatory duty,

as it was called, was the quantity of wool required in the manufacture of a pound of cloth ; and the theory of the tariff was to fix the specific duty at such a figure as to exactly reimburse the manufacturer for the duties paid on that amount of wool, and thus to leave him in the same position, so far as foreign competition was concerned, as though his wool had been free of duty. The theory implied that the full amount of the duty on foreign wool was added to the domestic price of the material, whether the same was imported or home-grown. As a matter of fact, this theory, while not always borne out by experience, has generally been so, with temporary variations due to unequal fluctuations in the foreign and domestic prices.

Investigations and experiments made by manufacturers prior to the passage of the act of 1867, established the fact that it required four pounds of greasy wool to manufacture one pound of finished cloth. This calculation was based upon the shrinkage and waste of a mestizo wool of South America, which was the foreign wool chiefly imported at the time of the passage of this tariff, and also chiefly employed in the European manufacture. The Australian wool, which is to-day the chief source of foreign supply, was already beginning to play an extremely important part in the European manufacture ; but this wool was hardly known in the United States prior to the tariff of 1867, and its first considerable use in this country began in 1872, in which year the imports suddenly jumped to over 12,000,000 pounds.

The mestizo wool, as then marketed, was very dirty and burry, making its average shrinkage in scouring 67 per cent., and the further loss in manufacturing was calculated at 35 per cent., making the following formula :

Given, 100 pounds of greasy wool :

Loss in scouring, 67 per cent.,

leaves 33 pounds clean wool.

This clean wool loses 35 per cent. in manufacturing.

33.00 pounds, less 35 per cent., or 11.55 pounds,

leaves 21.45 pounds of cloth.

100 pounds (greasy wool) $\div$ 21.45 = 4.66 pounds of wool to one pound of cloth.

It was not pretended that domestic wools whose shrinkage was much less than that of mestizo would consume four pounds to each pound of cloth, the contention being that in order to equalize conditions the law must take cognizance of the heaviest shrinkage wools accessible to foreign manufacturers, which was the material upon which the amount of compensation must be based, in order to be an equalizing compensation. Neither was it claimed that all varieties of cloth to which these compensatory duties were applied would consume four pounds to the pound of cloth, even of the mestizo wools. On the contrary, these compensatory duties, necessarily made uniform, applied to goods into which cotton warps entered, and in which, in consequence, the amount of wool employed might be reduced to three, or even two pounds of wool to the pound of cloth. The argument was that the compensatory rate must be placed high enough to cover the added cost of the wool required to make the highest grades of cloth, or otherwise the effect would be to interdict the domestic manufacture of those higher grades. As a matter of fact, the tariff of 1867, while favored by a majority of the manufacturers of that day, was strongly opposed by other manufacturers, for whom the late Edward Harris, of Rhode Island, was the principal spokesman, on the ground that the compensatory duties were not sufficient to permit the successful manufacture of the high-grade goods of fine finish in which the loss from napping and other final processes exceeded the allowance made in the calculation above given. Be that as it may, the basis of adjustment between the duties on wool and on woolen goods, accepted and adopted in 1867, has remained in the law until the present time.

Upon the lower class of goods, of mixed material or containing a smaller modicum of wool, the rates of duty established by the act of 1867 proved essentially prohibitory in character, and this fact is to be borne in mind in the consideration of the extraordinary development of the domestic wool manufacture during the decade between 1870 and 1880.

In certain important lines of woolen goods, the domestic manufacture now began to supply practically the entire home market. This may be illustrated by the case of blankets. From 1848 to 1864 the importation of blankets uniformly exceeded \$1,000,000 annually in value, and in 1860 they reached a total value of \$1,697,386. The shrinkage in their importation began in 1864. In 1867, the imports of blankets were valued at \$948,349, and in the following year they fell to \$55,006, and in several years during this decade they did not reach a value of \$5,000. Flannels were affected in the same manner. Imports of these goods had never been large; but in 1860 their value was \$178,890, and in 1866, \$149,615. After the tariff of 1867 they fell rapidly, and in 1875 the total value of flannels imported was only \$1,852. Other lines, such as cloths and knit goods, were affected in a lesser but still in a marked degree, and the total imports of woolen goods of every description showed a marked proportional decrease.

While there was no striking increase in the machinery capacity of the country during this decade, the value of the domestic products increased from \$217,668,826 in 1870 to \$267,252,913 in 1880.

To estimate properly the percentage of this increase, it is necessary to reduce the value of the product in 1870, when the currency of the country was worth 79.81 cents in gold, to the gold basis, as was done in comparing that census with the census of 1860. The gold value of the product of 1870 was \$173,721,490; and the actual increase during the decade 1870-1880 in the value of manufactured products was therefore 53.84 per cent., as compared with an increase in 1870 over 1860 of 115.18 per cent., calculated on a gold basis.

Such an increase in product, when compared with the increase in machinery capacity, indicates with sufficient clearness the great increase in efficiency of the machinery employed.

1880-1890.

It is the purpose to review more in detail the advance of the manufacture during the last decade, the foregoing rapid summary of its previous development and conditions being merely preliminary. In the present connection it is only necessary to present, in summary form, the comparative results of the two censuses:

GENERAL HEADS.	1890.	1880.	Percentage of increase.
Number of establishments reported	¹ 2,489	2,689	² 7.44
Capital invested	² \$296,494,481	\$159,091,869	³ 86.44
Value of hired property	\$17,320,780		
Number of hands employed	219,132	161,557	35.64
Wages paid	\$76,660,742	\$47,389,087	61.77
Cost of materials used	\$203,095,572	\$164,371,551	23.56
Value at factory of goods manufactured . .	\$337,768,524	\$267,252,913	26.39

The progress of the decade was therefore healthy and rapid, quite equal in its ratio to that of any long established industry.

In this comparison we must bear in mind the fact that the year 1879-1880, in which the prior census was taken, was a year of unusual and at times even speculative activity in the wool manufacture, and it is commercially recognized as the most prosperous year the industry has encountered since the war. On the other hand, the year 1889-1890 was a comparatively dull year in the wool manufacture, in which a considerable portion of the machinery of active mills was idle during a part or the whole of the year.

Another fact to be considered in making the comparison is the large reduction in the market value of the goods covered by this report. Probably no previous decade witnessed so

¹ Not including 267 idle establishments reporting invested capital amounting to \$6,107,360.

² Decrease.

³ The great increase shown in the amount of capital employed as between 1890 and 1880 is more apparent than real, and is largely due to the fact that the capital returned for the census of 1880 did not take cognizance of all items which properly go to make up "live assets," and which, it is believed, are for the first time fully included in the census of 1890.

general a downward movement in prices. The value of products now given indicates a much greater quantity of production than the same value in 1880 or in any previous year would have signified. Something of the measure of this decline in value of products is indicated by the fall in the cost of raw materials.

RETROSPECT AND SUMMARY.

We find the domestic wool manufacture in 1890 at a point of development where it is fairly comparable with that of European countries. It is exceeded by that of Great Britain in the quantity of wool consumed, and probably in the value of product. It exceeds the wool manufacture of France, Germany, and every other continental nation in both particulars. Its advance during the last thirty years has been far more rapid than in any other country. This fact may be demonstrated by a comparison with Great Britain, whose statistics of wool consumption are more accurately compiled than those of any other European nation.

Before 1860 we imported more woollen goods, in duty-paid value, than we made in our own factories. Our woollen manufacturers consumed but 98,379,785 pounds of greasy wool in that year. In 1890 their consumption had grown to 434,000,000 pounds. In 1860 the British manufacture was consuming 300,000,000 pounds of wool annually, three times as much as our own. In 1890 the British manufacture consumed about 470,000,000 pounds, or but 8 per cent. more than our own. In these thirty years our manufacturing consumption of wool has increased nearly 340 per cent., while that of Great Britain has grown 57 per cent.

In making this comparison we do not imply that the American manufacture is in every sense on a par with that of Great Britain. On the contrary, practical manufacturers familiar with the conditions of the industry in both countries are well aware of certain points of inferiority. Organization is better in England, and attention to details is more thorough

in consequence. In what may be called the economies of manufacture, the English surpass our own manufacturers as a rule, and are probably not surpassed in the world. They have been trained in these economies by their long experience in catering to foreign markets, where they encounter a constantly closer competition. They possess certain definite advantages growing out of the less mobile character of the operative classes. It is common for English workmen in the textile industries to pass their entire lives in the same mill at the same class of work. In the United States the factory population is constantly shifting, not only from mill to mill, but from town to town and into different occupations; and there is increasing difficulty in obtaining and retaining properly trained help. These conditions naturally affect not only the economies of manufacture, but also to a certain extent the quality and character of the products. There are lines of high-grade goods in which the American product does not regularly approach the fineness and perfection of finish peculiar to the goods of foreign mills, which have been exclusively employed on those particular lines for generations. This is especially noticeable in connection with certain products which are the peculiar glory of the French manufacture.

Other conditions have had their bearing in the struggle to overcome this inferiority. Some of these may be described in detail.

I. In England the system of sorting and classifying wools is carried to such perfection that the wool market is amply supplied with all the different sorts, so that the manufacturer may profitably run his mill on the finest or the lowest sort. From the want of concentration of wool in our markets, and other causes, the American manufacturer sorts his own wool, and having it of different grades must make goods of corresponding grades. He must make low as well as high class fabrics; and it has followed that there has been less tendency on the part of the domestic manufacture to confine itself to single specialties, and to base reputation and success upon those specialties.

II. Still again American manufacturers have been handicapped by the comparative lack of expert training in the important departments of designing and dyeing. While the importance of a close and skillful attention to the selection, preparation, and spinning of wool is not easily overestimated, yet it has become more important every year that the highest skill shall be employed in determining the organization of fabrics, both as to pattern and coloring. The wool manufacture has entirely changed in the last sixty years in this respect. Formerly it was employed upon plain textures, of plain colors. The introduction of fancy goods has made it impossible to determine from one season to another what freak or fluctuation in the popular taste will next dominate the market. In this state of facts the designing department becomes the real key to the success of the mill. To study the tendencies of the times, to anticipate them if possible, to capture public favor by novelty of design or pattern, is an art which only long training can impart to great natural aptitude. In the same way the mysteries of the dyehouse are a study worthy of the highest mind, and the introduction of aniline dyes has made possible new combinations and shades of coloring, which are constantly appearing.

III. The facilities for technical education in these important departments of manufacture are superior, in all the manufacturing countries of Europe, to anything existing in the United States. Textile schools exist in Germany, Belgium, Austria, and France, equipped with the most skillful instructors and every appliance, supported wholly or in part by the government, which turn out annually large bodies of carefully trained young men, who take their places in the factories, where they supplement by practical experience the instruction they have received in every department of the manufacture. Of late years similar educational institutions have been established at the chief textile centers of England, also the recipients of public support, and they have rapidly advanced to an efficiency almost equal to that of the continental schools. The influence of these institutions upon the

development of the textile industries of the countries in which they are located has been greater than we realize in this country, where we have depended, for the education of experts, upon the schooling of the mills themselves. One school, the Lowell School of Design, connected with the Massachusetts Institute of Technology, has for many years supplied in a limited degree a training somewhat similar to that obtained in these foreign schools. In 1883 a second school, planned to cover instruction in all branches of the textile industry, was established in Philadelphia, in connection with the Pennsylvania Museum of Fine Arts, through the liberality and public spirit of a few of the leading manufacturers of that city. It has already achieved a notable success, and its graduates are found in the leading mills throughout the country. But its resources are limited, and its capacity still more so, in view of the enormous development of our textile industries during the last quarter of a century. The more successful of our designers and experts in dyeing still come to us from across the water. The United States is far behind Europe in its facilities for the training of men and women in the great work of the application of art to the textile manufacture.

IV. In the mechanical departments the best American mills do not at present suffer in comparison with those of any other country. We have seen that in the earlier years of the century our manufacturers were terribly handicapped by the inferiority of their machinery. This inferiority they gradually overcame, largely by original inventions, and in other particulars by the importation of foreign built machinery. The catalogue of American contributions to the mechanical development of wool manufacture is so imposing that the late Dr. Hermann Grothe, the German expert, was led to write that it is not surpassed by that of any other nation, not excepting even England. He says there are repeated cases where American finishing machinery has been exported to England and France to become the basis of other improvements, claimed to be original, and essentially con-

tributing to the establishment in those countries of the textile industries. * This is prominently the case, he adds, with the machinery for fulling, gigging, and shearing cloth; the fulling mill with rollers is completely an American invention (that of John Dyer, patented in 1833); the invention of the double-crank shaft fulling mill was made by Levi Osborne in 1804, commencing a great series of constructions of the same principle; all the English gigging mills were patented after the gigging mills in America of Christie, Olney, Barrows, Beck, Wells, and others, had appeared; the merit of the invention of the cylinder shearing machine belongs to Samuel Griswold Dorr, and of the pressing machine with steam to Seth Hart, who received a patent in 1812. The invention of machinery for the manufacture of felted cloths is exclusively American in its origin. The principle of all the machines for burring wool used here and abroad, viz., striking the burr from a card or toothed cylinder by means of a rapidly revolving guard or blade, was first applied to a machine about 1833 by Michael H. Simpson, of Boston, whose improvements upon the Couillard combing machine were also of a nature so radical as to entitle them to rank as original inventions. Allusion has already been made to the Goulding invention, which dispensed with the billy, and which has been described by Dr. Hayes as "the most important of all contributions to the card-wool industry of the world during the present century." Power was first applied to the knitting machine in the United States in 1832 by Egbert Egberts, at Cohoes, New York; and in the variety, the ingenuity, and the importance of the knitting machines for making fashioned knit goods, the American contributions are more important than those of all other countries combined. The power carpet-loom, in all its varieties, is wholly an American conception, and it marks the greatest advance of the nineteenth century. Of looms generally it is recognized that the American inventions and subsidiary appliances are superior in every respect to those of any other country, and they are now made and largely used abroad under concessions from the patentees.

In the subsidiary improvements of machinery for the manufacture of wool, in the scouring machines, the feeding appliances, the automatic stop-actions, the thousand smaller mechanisms which increase efficiency and production, which economize labor, and impart regularity and perfection of manufacture, the American contributions have been too innumerable to catalogue, and they have advanced the manufacture, in matters of detail, quite as far, although by less radical steps, as the machines which involved the application of some new principle in mechanism. Many of our mills are in no sense behind the best English mills in the application of these minor mechanisms. While the American visitor in English mills will be struck with some radical points of difference in equipment, he will conclude that in point of general mechanical efficiency the industry occupies practically the same footing in both countries.

The most striking point of difference in mechanical organization lies in the fact that English mills, like those of France and Germany, are as a rule equipped for special classes of work, to the exclusion of all others, while the American mills as generally are equipped for a great variety of processes and of products. The advantages gained by this specialization are too obvious to be dwelt upon at length. A worsted spinning mill, equipped to make a particular number of yarn, will produce that yarn with a greater economy than a mill, equally perfect in machinery, which is compelled to constantly adjust that machinery to the production of yarns of different numbers.

V. The United States is the only one of the large wool manufacturing nations which does not have free access to the wool markets of the world. It has developed its wool manufacture along lines very largely determined by this unique position among its competitors, and comparison with other countries is made more difficult on this account. To offset the fact stated, it is true that the United States is the only large wool manufacturing nation which supplies within itself the larger proportion of the raw material consumed in

its mills. Of the wool consumed by Great Britain in 1890, 120,000,000 pounds was home grown and 350,000,000 pounds was foreign grown. France consumed in the same year 124,000,000 pounds of domestic wool and 295,000,000 pounds of imported wool. The United States reversed these proportions, consuming 258,681,000 pounds of domestic and 114,116,000 pounds of imported wool, three-quarters at least of the latter being third-class wool consumed in the carpet manufacture. The consequence of this dependence upon a domestic supply has been to very largely persuade the home manufacturer into the production of those classes of goods to which the wools of the United States are best adapted, and for which it is conceded that they have no superiors.

Since the policy of a tariff on wool for the purpose of fostering domestic production was first adopted by the United States, the conditions surrounding the wool supply of the world have radically changed. At that time each manufacturing nation relied chiefly upon its home supply of the raw material—England, in particular, depending almost wholly upon her domestic clip, which had been recognized for centuries as one of the chief sources of the national wealth. In 1830 the exported wool clip of the Argentine Republic was barely 60,000,000 pounds; in 1890 it was 258,000,000 pounds, and in previous years it had surpassed 350,000,000 pounds. In 1842 the Australian export of wool was 14,000,000 pounds, that being the first year in which its statistics were recorded; in 1890 the Australian wool clip was 550,000,000 pounds. The Cape of Good Hope clip has increased from 26,000,000 pounds in 1860 to 128,681,000 pounds in 1890. These three countries, which were hardly a factor in the world's wool supply in 1830, are now the sources from which is drawn nearly two-thirds of the clothing and combing wools.

The economic influences of these changes in the sources of the wool supply can hardly be traced or estimated, although they are visible everywhere. The United States has been exempt from them, to a very large degree, so far as the manu-

facture is concerned, not more than 36,000,000 pounds of these wools having reached this country in any one year. But the effect of this constantly increasing new supply of raw material, a supply which at times has seemed to increase faster than the demand, has been very perceptible in the domestic wool markets, where the prices of domestic fleece have sympathized very closely with the fluctuations in prices abroad. The average annual price of the average Port Philip fleece has fallen in the London market from 25 pence in 1873 to 16 pence in 1890, and of Buenos Ayres average greasy from 7 to 5 pence between the same years, while the decline in Ohio medium fleece was from 68 cents in 1873 to 37 cents in 1890. In view of the steady forcing down of the price of domestic wool, notwithstanding the tariff, by the pressure of increased production, on a large scale, in these countries of the southern hemisphere, where the conditions attending sheep raising are in some respects superior to those of our own country, it may be taken for granted that there will never be any considerable exportation of domestic wool.

On the other hand, it is not to be expected that there will ever be any considerable domestic supply of the coarse long wools, which are chiefly relied upon by our great carpet industry. The sheep producing these wools are comparatively worthless for mutton, their fleece is light in weight, and because of its coarseness brings a comparatively low price in the market. The culture of such sheep is not likely to be pursued as a final object where any purpose is entertained of improved sheep husbandry, and in those sections of the United States where the native sheep of Mexican origin have predominated, the breeding up has been rapid. We have produced admirable carpet wools in Colorado and the territories, equal in whiteness, strength, and length of staple to the best imported from South America. But the supply of domestic carpet wools now reaching the markets is merely nominal; and it is a fact well recognized by intelligent growers that carpet wools cannot be grown with profit in this country, and therefore that practically they cannot be grown at all.

In the production of fine wools the domestic supply, instead of increasing in consonance with the increased requirements of the American manufacturers, is growing less from year to year. In Pennsylvania, Ohio, Michigan, and other States which are peculiarly adapted to the growth of fine wools, and from which the domestic supply has come, the number of sheep has been steadily declining for many years. While improvements in machinery have permitted a larger and larger use of the increasing supplies of territorial wools for purposes akin to those of the fine wools, yet there exists a deficiency, which is made up by increasing importations of Australasian wools. It is frequently asserted that the United States possesses every variety of soil and climate and all the food conditions necessary to produce every grade of wool in quantities equal to the utmost domestic demand. Regarding this proposition, it is enough to say that if the conditions exist the supply does not, and that the deficiency must therefore be made up from foreign sources. The increase in our importations of Australian wools has been the most marked characteristic of the industry during the decade ending with 1890. The records of the Treasury Department do not contain the complete details of Australian wool imported in 1879 and 1880. The direct importations were 399,518 pounds in 1879 and 7,666,604 pounds in 1880, additional supplies coming in both years from the London auction sales. In 1890 the importations direct and via London reached a total of 11,950,158 pounds, and in several prior years were even more, reaching 16,577,974 pounds in 1886. While these importations are insignificant in amount when compared with the domestic wool clip, they are very large in comparison with the domestic clip of strictly fine wool of a like grade. In making their purchases of Australian wool the American manufacturers and dealers are confined to the wools of lightest shrinkage, upon which the duty operates the least severely, and as the supply of light-shrinkage wools is limited, the American competition influences to increase their price over that of the other wools of like quality but heavy shrinkage,

thus further limiting their purchases as compared with what they would be under an ad valorem form of duty.

It is difficult to estimate the effect of the tariff upon the price of domestic wool with any certainty, owing to the great variety of the conditions entering into the problem. That the American tariff has operated at times to depress the price of wool abroad is beyond question, and to the extent it has so operated the difference in the price of certain wools here and abroad has not been equal to the amount of the duty upon these wools. The most careful statement on this question that has been prepared was made for the sub-committee of the Senate Finance Committee in 1892, by Mauger & Avery, wool dealers, of Boston and New York.

VI. Another disadvantage under which the domestic wool manufacture labors is the fact that it is, and always has been, subject to conditions by which styles and fashions are determined abroad. London sets the fashions in men's wear goods, and Paris in women's wear goods. The American manufacturer, except the maker of plain and staple fabrics, is compelled to follow the styles determined in these cities, if he expects to command the home trade. This is always a difficult and sometimes an impossible thing to do, under the existing system which compels the manufacture of goods fully a year in advance of the season for whose wear they are intended. The difficulty is greatly increased by the survival of the prejudice born in the primitive days of the manufacture, in favor of foreign as against home-made wools. This prejudice is disappearing, but it is still a positive factor which must be recognized. Mr. H. N. Slater, of Webster, Massachusetts, in a letter written in 1888, stated the degree of this prejudice and the common method of meeting it, as follows :

Our family has been engaged in the broadcloth manufacture in this town since 1818, during which time more or less fine Saxony wool has been required and imported for us. . . . These superfine cloths have never been sold directly to the merchant tailor as American, and could not now be if manufactured. The impression is general among the trade that they cannot be made

in this country, the average consumer wanting something "foreign." During many years (40 years ago) our goods were made, tilloted, and sold (but not as a rule directly) as foreign goods. No merchant tailor thinks of offering a fashionable gentleman a fine American cloth.

The habit of affixing foreign labels to home-made goods is still a common one, and is a device warranted by a prejudice which is no longer justifiable on any ground, and is in strange contrast with the intense Americanism of our people in other respects.

In the facts last stated may be found one of the chief reasons why the quantities and values of woolen goods imported into the United States have exceeded those in any other manufacturing industry, with the single exception of iron and steel, almost from the beginning of the century. In its ratio to the value of the domestic product, the value of woolen goods imported has largely exceeded that of the imports of iron and steel. What this ratio for woolen goods has been at each of the census periods from 1820 is shown in the following table, which also gives the value per capita at each of the census periods, both of the domestic products and the importations, and the percentage of each in the total consumption of the year:

COMPARATIVE STATEMENT OF DOMESTIC AND IMPORTED WOOL MANUFACTURES, WITH PER CAPITA VALUE AND PERCENTAGE OF TOTAL CONSUMPTION. (a)

DOMESTIC MANUFACTURES (CENSUS).		Value per capita.	Per cent. of total consump- tion.	NET IMPORTA- TIONS(AVERAGE FOR 10 YEARS).	Value per capita.	Per cent. of total consump- tion.
Years.	Value.			Value.		
1820	\$4,413,068	\$0.46	39	<i>b</i> \$6,859,702	\$0.71	61
1830.....	14,528,166	1.13	64	8,290,862	0.64	36
1840.. ..	20,696,999	1.21	60	13,950,772	0.82	40
1850.....	49,636,881	2.14	79	13,005,852	0.56	21
1860.....	80,734,606	2.57	72	31,333,273	1.00	28
1870	217,668,826	5.65	87	33,046,521	0.86	13
1880.....	267,252,913	5.33	87	39,537,694	0.79	13
1890.	337,768,524	6.30	89	43,345,981	0.69	11

The value per capita of the domestic manufactures in 1870 is a currency value, at a time when the gold value of the dollar averaged 79.8 cents. Allowance being made for that fact, the per capita valuation of the product has shown a nearly uniform increase in each decade since 1860, and was in 1890 just 2.10 times the value per capita in 1860. In other words, the increase in the industry has been in more than double the ratio of the increase in the population. The decrease in the per capita value of the imports of woolen goods has not been in the same ratio, showing that the consuming capacity of the American people has kept steadily in advance of the increasing productive capacity of her wool manufactures. The percentage of foreign goods in the total annual consumption of our people is now no larger than in Great Britain.

The method of selling the products of woolen mills through the agency of commissioned houses had its origin in the early part of this century. The house of Joshua Clapp, of Boston, established in 1821, is believed to have been the first store in America for the sale of American woolsens on commission. His stock consisted of red flannels from the mills of

a Cotton hosiery and knit goods, included in the census figures of this table, are not included in the value of imports.

b Net imports for year ending September 30, 1821.

Abraham Marland and Nathaniel Stevens, both located in Andover, Massachusetts, and a few pieces of American broadcloth from the Crowninshield Mill at Danvers. Once or twice a month the stock was replenished by the receipt of goods manufactured in the meantime at the factories, which were brought from Andover to Boston in a one-horse wagon, each load consisting of from ten to twenty pieces of flannels, carefully folded in paper wrappers. The business was from the first successful, and Mr. Clapp gradually extended his operations, becoming interested in the manufacture as well as sale of goods, eventually as the manager of the Litchfield Mill, in Torrington, Connecticut, owned by Hon. Frederick Wolcott. Other houses entered the commission business, and their members thus became more or less directly interested in the domestic manufacture. It was a time of transition in the industrial development of New England. Changes occurred which were to determine the chief direction of the commercial energies of that section of the country. Boston had heretofore depended upon her shipping and foreign trade as the chief source of her business activity, and the weight of her influence had been strongly against national legislation to build up these domestic manufacturing interests. In October, 1820, at a meeting held in Faneuil Hall, Hon. Daniel Webster, speaking for this interest, predicted that under the legislation then existing "two generations would change the whole face of New England society." Mr. Webster's prediction was realized, for within the limits of the time he set Massachusetts became the chief wool-manufacturing State of the Union, as well as first among the cotton-manufacturing States, and the capital and energy of her commercial center were absorbed in the distribution of the products of these and other industries. The commission business grew with the growth of the mills, and the two lines of business became so intimately associated and blended through joint ownership that the points of demarcation were almost undistinguishable. There were advantages and disadvantages connected with this relationship ; but the lesson of experience has been that

the manufacturer has not as a whole been the gainer from it; that it is a relationship peculiar to the formative period of industrial development and necessitated rather by limited capital than by inherent fitness. In the evolution of later years, emphasized by the harsh experiences of manufacturers in times of commercial crisis, the tendency has been steadily towards the independence of the producer in the direction of the selling of his own goods. The intervention of the jobber has to a large extent disappeared through the larger sale of goods directly to the most important consumers, thus tending to bring producer and consumer nearer together. But the absence of anything like uniformity, in methods of marketing products, is still characteristic of the American industry, and is very striking in comparison with the uniform system prevailing in Great Britain.

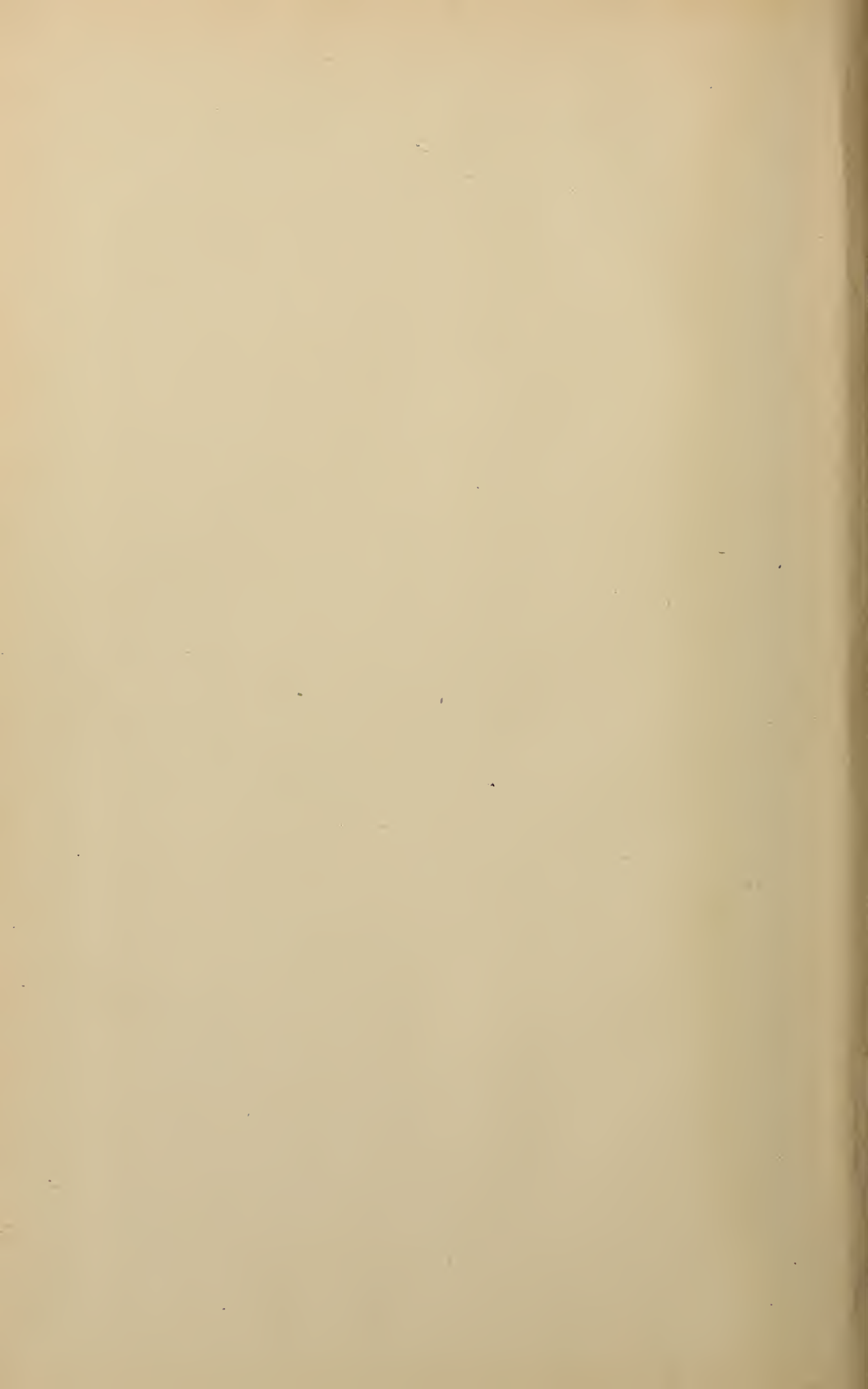
In concluding this report the special agent may remark that he has been impressed throughout the investigation with certain peculiarities of the wool manufacture, in comparison with other industries, which distinguish it as an occupation requiring a high degree of intelligence and skill on the part of those who successfully conduct it. No branch of industry makes larger demands upon those elements of capacity and character which win success in manufacturing. The foreign manufacturer, in visiting our mills, is astonished at the great variety of operations carried on in single establishments, and at the high degree of administrative efficiency displayed in their management. There is that about the industry which attracts men of large ideas and capabilities. It offers ample scope for the employment of faculties of the highest order, and the field of success is comprehensive enough to fit the highest business ambition. The art of wool manufacturing becomes attractive and absorbing by its varieties, its possibilities, and even by its uncertainties. There is no recognized limit to attainment within it. Success serves but to stimulate to new endeavor. The creative instinct may find in it opportunity for exercise either in mechanical construction or in new methods and varieties of fabrication. Artistic

taste is constantly spurred to adapt beauty of design to harmony of color, to combine the ornamental with the useful. There is also an inspiration in the thought of developing and perpetuating a great national industry, venerable because of its antiquity, benevolent because of its intimate relationship to the comfort, the happiness, and the prosperity of the people.

The view taken in this report of the rapid progress, the peculiar difficulties, and the unique achievements of the United States in this industry justifies the conclusion that the wool manufacture as it stands to-day is among the foremost evidences of the industrial resources of our country.

[NOTE. — As stated in the introductory note, the above summary review of the development of the wool manufacture in the United States was written in 1890 as an introduction to the Eleventh Census Report on that industry. It is therefore necessarily incomplete; and the reader who is interested to trace the growth of the industry between the years 1880 and 1890, and in the details of the historical development of the different branches of wool manufacturing in the United States, is referred to the volume of the Eleventh Census Reports on the Textile Industries, published by the Department of the Interior in 1894.]





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